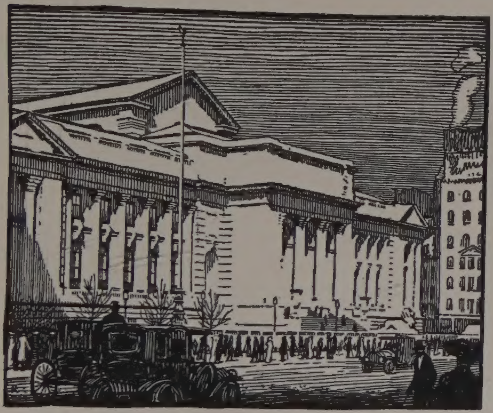
BULLETIN

OF THE

NEW YORK PUBLIC LIBRARY

ASTOR, LENOX AND TILDEN FOUNDATIONS



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I. FERRIS LOCKWOOD
Bursar of The New York Public Library

BULLETIN
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NEW YORK PUBLIC LIBRARY
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LUME 31 MAY, 1927 NUMBER 5

Death of Mr. Lockwood

MR. I. FERRIS LOCKWOOD, for many years Bursar of the Library, died suddenly at his desk on the afternoon of Friday, March 10, after rty-four years' service with the Library.

He was born in Dubuque, Iowa, on February 23, 1855, the son of George ward and Catharine (Burchan Ferris) Lockwood. He took his name from mother's father, Rev. Isaac Ferris, who was chancellor of New York iversity from 1852 until his retirement in 1870 as chancellor emeritus.

He studied at his grandfather's university, taking the degrees of B.S. and E. in 1873, and giving the commencement oration at graduation. The xt twenty years saw him in various activities. For three years he followed profession as civil engineer. In 1876 he taught in the school his mother d established. In 1882 he was associated with Mrs. William B. Rice and iss Louisa Lee Schuyler in the work of the New York State Charities Aid sociation. For a short time he was with Scribner's Magazine, writing eral articles and book reviews. He wrote two books, "The Nature of etry," and "A Few Steps in Philosophy."

In June, 1893, he was chosen superintendent of the Lenox Library in cession to Dr. George H. Moore, who had died in May, 1892. In the vice of the Lenox and The New York Public libraries he spent the rest his life. The title of his position changed from time to time, but the man self changed little except to grow more strongly in the respect and affec- of those privileged to work with him.

When Dr. Billings reorganized the staff of the Library in 1896, after he k active charge of the newly consolidated institutions, he brought Mr.

Lockwood from the Lenox building to the Astor and made him Business Superintendent. Another change of title took place when the new Central Building was opened in 1911 and Mr. Lockwood became Bursar.

Throughout his life he took a keen and sane interest in art. Largely self taught, he came to sketch and draw well, and he found in pastel a satisfactory medium for expression.

As a great grandson of Rev. William Lockwood (1753-1828), brigade chaplain to Nixon's and Paterson's brigades of the Massachusetts troops in 1780 and 1783, he was a member of the Society of the Cincinnati and of the Sons of the Revolution. He became a member of the Century Association in 1890.

On June 5, 1889, he married Miss Sarah Wisner, who, with their two daughters, Mrs. Alfred F. Loomis and Mrs. Joseph D. Burge, and six grandchildren, survive him.

GIFT OF UDO BRACHVOGEL PAPERS

By MABEL C. WEAKS

THE name of Udo Brachvogel (who died in his seventy-eighth year in
New York, January 30, 1913), was well known to German-American
ders of the preceding half century. He was regarded by them as one of
ir foremost journalists and one of their greatest poets, although he was
dly less distinguished as a translator. He wrote essays, short stories and a
el as well, but it is as a poet, writing always in his native German language,
t he will be remembered.

The late Mrs. Brachvogel, her daughter, Miss Claire Brachvogel, and her
, Mr. John K. Brachvogel, have given at various times certain personal
ers of Udo Brachvogel to the Library. The gift is a welcome addition
he important German-American Collection of the Library. Before enter-
upon a description of the papers, it may be well to rehearse briefly the
ef events of Brachvogel's career.

Born at Schloss Herrengrebin, the estate of his father, Ferdinand Brach-
gel, near Danzig, Prussia, September 26, 1835, he was educated at the
versities of Heidelberg and Bonn. He studied law at Jena and Breslau
m 1855 to 1858, but never practiced. The year 1860 found him in Vienna,
ere he enjoyed the friendship of Friedrich Halm, the German dramatic
hor, and Julie Rettich, the actress. He served as an official of a great pri-
e company in Hungary from 1860 to the spring of 1866, when he came to
United States. After a year in New York as a contributor to various news-
ers, he went to St. Louis to join the editorial staff of the *Westliche Post,*
leading German daily of the town. Here he was associated with Carl
urz as editor-in-chief and Joseph Pulitzer as a reporter on the paper.
h became his lifelong friends. In Schurz's home, Brachvogel met Käthe
iller of Oldenburg, Germany, whom he married, January 12, 1878, in
shington, D. C. From 1878 to 1886, he owned and edited the New York
letristisches Journal, the principal intellectual organ of the Germans in
United States. In 1886, he went to Omaha, Nebraska, to take charge of
Westliche Courier, a daily political newspaper, subsequently acting as
eral agent of the Germania Life Insurance Company of New York. He
transferred by the company in 1891 to Chicago, where he lived until
94, when he returned to New York to spend the remainder of his days
free lance writer.

The Brachvogel Collection, as the papers which have been presented to the Library will be known, consists of correspondence of Mr. and Mrs. Brachvogel, 1873-1925; the author's typewritten manuscript of his book of collected verse, *Gedichte* (Leipzig and New York, 1912); a German translation of Hawthorne's *Scarlet Letter,* which was made for Walter Damrosch's opera on that theme; manuscripts of essays on the following subjects: *Annette von Droste Huelshoff, Zum Deutschen Tag 1891, Lenau in Amerika, Grillparzer als Lyriker, Ein Ritt in's Romantische Land, Felix Dahn, Gerhart Hauptmann, Joseph Victor von Scheffel, Carl Schurz, Ludwig Uhland's Dichtungen, Ein deutscher Nach-Classiker,* and *Rheingold im Yukon;* two scrap-books of clippings from German-American newspapers containing Brachvogel's contributions on music, art, literature, and the theatre, short stories, and notes of his journeys from Mainz to New York and from New York to St. Louis in 1866 and 1867, respectively; two scrap-books of clippings from the *New Yorker Staats-Zeitung* containing articles contributed by Brachvogel in 1895, 1901-1904; a scrap-book of clippings containing *Juxta Crucem: Eine Geschichte aus dem Westen von Udo Brachvogel* and *Jacobus de Benedictis,* a poem which appeared later in *Gedichte* (1912); a German translation of Gabrielle d'Annunzio's *Le Feu,* as clipped from the *Morgen-Journal;* loose clippings from the various newspapers and magazines to which Brachvogel contributed; three manuscript copy-books of Brachvogel's early years; two note-books; reviews of *Gedichte* (Leipzig and New York, 1912); obituary notices; and the manuscript of Dr. Emanuel Baruch's address: *An der Bahre Udo Brachvogels.*

The correspondence of Mr. and Mrs. Brachvogel is of especial interest, the writers being for the most part Germans, German-Americans, Austrians, or Hungarians who have distinguished themselves in literature, music, the theatre, or the professions. As the editor of the *Belletristisches Journal* and the correspondent of the *Kölnische Zeitung* and the Vienna *Neue Freie Presse* in America, Brachvogel was in a position to make contacts with writers, musicians, and actors who became friends of himself and his wife. One of their oldest and most valued correspondents was Carl Schurz. The collection contains fifty-five of his letters and post-cards, dating from 1878, when Schurz was serving as Secretary of the Interior, to 1906, the year of his death. Two other Forty-Eighters, members of that extraordinary group of men who came to the United States from Germany in 1848, were friends and correspondents, Dr. Abraham Jacobi and Dr. Hans Kudlich. To the latter, on the occasion of his eightieth birthday, Brachvogel wrote one of the poems in *Gedichte* (1912). Five of the letters were written by an early friend of the

Louis days, Joseph Pulitzer, who was Brachvogel's close companion and m-mate for years. A portrait of the two men, taken together, is repro- ed in Don C. Seitz's *Joseph Pulitzer His Life & Letters* (New York, 26).

Mr. and Mrs. Brachvogel's musical friends included many well known nes. There are letters and post-cards from Walter Damrosch, Josef ansky, Moriz Rosenthal, and Felix Mottl; and from the following grand ra singers: Minnie Hauk of American birth, who became the Baroness Wartegg; Fanny Janauschek, Fanny Lewald Bahr, Marianne Brandt, li Lehmann, Berta Morena, Pauline Lucca, and Ernestine Schumann- ink. Marie Geistinger, the Viennese singer of light opera, was a corre- ndent for many years.

The literary correspondence comprises letters and post-cards from Fried- Bodenstedt, the poet, written mostly while touring the United States in 0; Friedrich Arnold Brockhaus, the publisher; Ludwig Anzengruber, the strian dramatist; Paul Heyse, the novelist; Paul Lindau, the manager of Berliner Theater; Ludwig Fulda, Wilhelm von Polenz, Professor Ju- Rodenberg, Maximilian Harden, Baron Ernst von Hesse-Wartegg, ncess Helene von Racowitza-Schéwitch, Mrs. Marie Hansen Taylor, e of Bayard Taylor, and James Huneker.

The following German actors are represented in the collection: Ernst von ssart, Rudolf Christians, and Friedrich Haase.

Although Brachvogel devoted his life to writing, he published only two ks, both collections of verse, the first *Gedichte* (Wien, 1860); and the ond, *Gedichte* (Leipzig and New York, 1912). The latter incurred the approval of the Russian censor in 1914 on account of two short poems itled *Mukden* and *Moskau.*

Brachvogel also published *Das Theissland und sein Dichter. Vortrag, halten vor dem Deutschen Gesellig-Wissenschaftlichen Vereine von New rk, am 26. November 1879 (Deutsche Gesellig-Wissenschaftliche Verein New York,* No. 3), and . . . *Bret Harte* (Breslau: S. Schottlaender 382], Deutsche Bücherei [hft. 14] 23 p.). He was one of the contribu- s to Baron Ernst von Hesse-Wartegg's book, *Nord-Amerika, seine städte d Naturwunder, sein Land und seine Leute. Von Ernst von Hesse-War- g. Mit Beiträgen von Udo Brachvogel, Bret Harte, Theodor Kirchhoff, nry de Lamothe, Charles Nordhoff, Bayard Taylor und Anderen* (Leip- , 1880).

Brachvogel translated from the Hungarian, Italian, French, and English guages. Edgar Allan Poe, Bayard Taylor, Bret Harte, Alexander Petöfi, Émile Zola, Gabriele d'Annunzio and others found in him an admirable interpreter. It was he who introduced the works of Bayard Taylor and Bret Harte into Germany. Acknowledgment was made by Bret Harte in the following dedication to *The Story of a Mine: To Udo Brachvogel Esq. whose clever translations of my writing have helped to introduce me to the favor of his countrymen, both here and in Germany, this little volume is heartily dedicated. New York, December 1877.* This was one year prior to Harte's appointment as United States Consul at Crefeld, Germany, where he served until 1880, when he went to England. Thereafter most of his work was published simultaneously in England and in Germany.

Brachvogel also translated a book by Henry T. Finck under the following title: *Romantische Liebe und persönliche Schönheit. Deutsch von Udo Brachvogel* (Breslau: S. Schottlaender, 1890), 2 vols.

An adequate history of German-American literature is yet to be written. When it is, the contribution of Udo Brachvogel must be taken into account. It is hoped that the material herein described will serve a useful purpose at that time.

WHAT NEWS IN THE PRINT ROOM?

THE usual annual exhibition of "Recent Additions to the Print Collection" has been opened in Room 316 and will remain on view until vember. As it was last year, so now again the number of gifts among the essions has gone beyond the limits of one exhibition and made extra shows essary. Gifts from Mr. E. G. Kennedy (Seymour Haden collection) and children of the late Isaac John Greenwood (mezzotints by John Green- od, etc.) were shown earlier in the season, and the modern Italian prints en by Mrs. Harry Payne Whitney and the Italy-American Society, the stralian etchings presented through "Art in Australia," and the Australian kplates which came from Mr. P. N. Barnett, will be placed on view later.

An exhibition of this kind, in which the pieces have been assembled solely reason of recent accession, forms a sort of pictorial catalogue, which shows which direction the collection has grown, and from which the visitor may ose to meet his taste. The chief attraction here lies in the choice, which is ed a bit both by inclusiveness and variety of the exhibits. In that spirit one s the prints displayed not so much as a heterogeneous mosaic, but as an portunity for indulging one's special likes and hobbies. Even when the ticular hobby is touched on but lightly, in passing, the way is pointed out more detailed enjoyment in the Print Room. That is the main purpose of h records of accessions: they are guide-posts to pleasures, indications of ources of the Print Room's portfolios.

The tastes and interests which can be met by prints are numerous indeed. at, again, is emphasized by the wide variety of a graphic recital of growth h as this. In the present exhibition the person interested in 15th or 16th tury engravings, or Czecho-Slovak or Jugo-Slav art of to-day, or the ied handling of etching or lithography or wood engraving in Europe and United States, or some special subject dealt with in prints, or bookplates, what you will, can find something or other to hold his attention.

Among the old prints, for instance, there are a very interesting woodcut rmerly attributed to Wolf Huber) by the Monogrammist H. W. G. and etching by Lautensack, as examples of early treatment of landscape *per se,* a subject of absorbing interest. Of a later and more sophisticated period landscape portrayal are plates by Claude *(Le Bouvier)*, Canaletto, Belotto Waterlo. Altdorfer, "father of German landscape painting," is repreted by his noted woodcut, *Holy Family on the Flight, in a Chapel with a ge Baptismal Font,* apparently connected with the swarming pilgrimage the "Beautiful Mary" in Regensburg in 1520. It is an important specimen of the work of this versatile artist, ever warmly interested in the life about him, and alive to its dramatic possibilities. In the present print, the evident preoccupation, in the font, with the richness of silversmith work, the feeling for space, the technique in draughtsmanship and the fine fac-simile cutting, combine to make a production of rich interest.

In the tracing of influences and counter-influences between Northern and Southern art, Daniel Hopfer's copy of Mantegna's *Combat between Tritons* sounds its modest note, as does Lambert Hopfer's copy of Duerer's *Passion.* To look for relations between Duerer's *Apocalypse* and that of Jean Duvet, issued nearly two generations later, is a natural and fascinating diversion, into which Tietze-Conrat, among latest writers, has entered with gusto. Duvet,— *aurifaber* — master of strong goldsmith feeling, may here be studied in his mystic spirit, his symbolism, his compressed and crowded composition, his strange individuality shining through outer influences, in the *Opening of the Seventh Seal.* Away from the realm of fancy and speculation, to solid earth and into the next century, Jan Luykens takes us with his hundred pictures of arts and trades. In their contact with the actuality of daily life they form a refreshing contrast to much of the bumptiously allegorical illustration of that be-wigged and sententious epoch.

Projected by the time machine of fancy into the end of the 18th century, one may pore microscopically over Earlom's fine mezzotint reproductions of the richly and minutely detailed textures in Huysum's two fruit and flower pieces. The original paintings are typical of a formal flower treatment which came into a revival of favor with our interior decorators some years ago.

In the modern section of the exhibition the puzzle of group and personal thought, tendency and technique may be played with right varied results. There may be set up in a row Lepère for France, Lobisser for Germany, Meštrovič for Jugo-Slavia, Arent Christensen for Scandinavia, if you please. Or if process is to receive initial emphasis, see what Gauguin, Utrillo, Laura Knight and others do with lithography, or J. E. Laboureur with the burin — the use of which on copper is rare to-day,— or the late Ernest Haskell with the "flick" method (his *Arabella* shown in five states). Our own country's art ranges here from the calm mastery of Charles A. Platt to Peggy Bacon's droll reflection of life.

Mere enumeration of names is relegated to the appended list of artists represented, which further discloses the variety and inclusiveness which are naturally characteristic of such exhibitions.

F. W.

Artists represented in the exhibition of “Recent Additions to the Print lection”:

OLD PRINTS

lorfer, A.
occi, F.
otto, B.
k, Jacob.
nd, R.
nghel, P.
ssel, H. van.
T. de.
gkmair, H.
aletto.
esz, A.
et, Jean.

Earlom, R.
Gellée, Claude.
Hopfer, Daniel.
Hopfer, Lambert.
Jamnitzer, Wenzel.
Lautensack, H. S.
Lemberger, G.
Lorch, M.
Luyken, Jan.
Master of 1521.
Monogrammist A. L.
“ A. S.
“ F. G.

Monogrammist H. M., 1543.
“ H. W. G.
“ I. S.
“ J. S.
“ S. C.
Moncornet, B.
Passe, Crispin van de (the elder?)
Sweerts, Michael.
Traut, Wolf.
Waterlo, A.
Woensam, A. von.

MODERN PRINTS

European

ener, M.
lin, M.
dey, J.
nard, A.
nard, P.
el, F. M.
rdelle, A.
istensen, A.
is, M.
gen, K. van.
y, Raoul.
lell, Fritz.
ier, P.

Gauguin, P.
Guerin, Ch.
Haig, A. H.
Hall, Oliver.
Knight, Laura.
Laboureur, J. E.
Laroux, J.
Legrand, L.
Leheutre, G.
LeMeilleur, G.
Lepère, Aug.
Lobisser, L. S.
Maillol, A.
Marquet, A.

Matisse, H.
Mestrovic, I.
Moreau, L. A.
Orovida.
Pascin.
Rothenstein, Will.
Rouault, G.
Roussel, J. K. X.
Rytter, Paul.
Toulouse-Lautrec, H.
Utrillo, M.
Vlaminck, M. de.
Volkert, H.

United States

on, Peggy.
ey, V. H.
com, L. I.
sidy, I. D. G.
rch, F. S.
row, G.
willer, F. K.
, Kerr.
nch, E. D.
hs, Emil.
lagher, S.
ssby, Percy A.

Haskell, Ernest.
Hutty, A. H.
Kent, Rockwell.
Kent, Norman.
Lankes, J. J.
Lewis, A. Allen.
Little, Philip.
Matulka, Jan.
Melchers, Gari.
Miller, K. H.
Moorepark, C.
Nankivell, Edith.
Nordell, C. J.

Perard, V. S.
Platt, C. A.
Plowman, G. T.
Pullinger, H.
Reindel, W. G.
Rosenberg, L. C.
Sabin, J. F.
Sandzén, Birger.
Wales, G. C.
Webb, A. C.
Wortman, D.
Wright, George.

BOOKPLATES

rett, W. F.
, G. W.
ner, W. E.

Low, Will H.
Macdonald, A. N.
Sherborn, C. W.

Smith, S. L.
Teall, Gardner.
Pearson, R. M.

NEWS OF THE MONTH

GIFTS

DURING the month of April, 1927, there were received as gifts 4,234 volumes, 13,734 pamphlets, 103 maps and 5 prints. Some interesting items were the following:

Mr. Martin Erdmann gave the Library two mezzotints by Richard Earlom, 1778, from a painting by Van Huysum, 1722. From Mr. Levon West came his etching, "Blackfeet Glacier." Mr. Emil Ganso gave his aquatint, "Central Park." From Prof. Emil Orlik, Berlin, came one of his etchings, an illustration from "Li," a book on China. Mr. Amemiya gave the Library six photographs, made by him, of new buildings erected in the vicinity of the Central Library Building, including a photograph of the front façade of the Library.

Mr. Lincoln Ellsworth gave the Library copies, autographed by him, of two books, "First Crossing of the Polar Sea, by Roald Amundsen and Lincoln Ellsworth," New York, 1927; and "Americana," vol. 21, no. 1, January, 1927 (containing the article, "Lincoln Ellsworth, Civil Engineer and Explorer," by Winfield S. Downs). From the Beethoven Association came a copy (no. 161 of 500 printed for them) of a facsimile reproduction of the original manuscript of Beethoven's Sonata Appassionata, which belongs to the Library of the Paris Conservatory of Music. From Mrs. Henry Holt came a plaster bust of the Venus of Milo, and a collection of framed and unframed photographs of noted paintings (22 in number).

Gen. William Barclay Parsons gave the Library a copy of the "History of the Eleventh Engineers, United States Army; period covered Feb. 3, 1917-May 8, 1919" [by Van Tuyl Boughton], New York, 1926. From Mr. Clarence H. Mackay came a copy (no. 48 of 100 copies printed for private distribution only) of "The Clarence H. Mackay Collection by Wilhelm R. Valentiner, Italian Schools," New York, 1926. From the Alumni Association of the Boston Latin School, Boston, came a copy (one of 26 copies printed for the Association by D. B. Updike) of "The Public Latin School of Boston in the World war, 1914-1918; a Roll of Honor," Boston, 1925. Mr. Frank M. Gentry gave the Library a typewritten copy (one of three made) of his "Principles of the Theory of Relativity," 1923.

The following collections were received: From Miss Claire and John K. Brachvogel, a collection of photographs of theatrical celebrities, authors, etc., also clippings, note-books and letters. From Miss Mabel Choate came 209 umes and 19 pamphlets; from the Citizens Union of the City of New rk, 170 volumes and 140 pamphlets; from Mr. Holmes Foster, 151 umes; from Mrs. Thomas Dorsey, 27 volumes; from Miss H. E. Devoe, volumes; from Mr. Jacob de Haas, 6 volumes and 27 pamphlets; from ss Mary B. Hull, 47 volumes and 5 pamphlets; from Mrs. I. Ptacek, 118 umes; and from Mrs. J. L. Worden, 8 volumes.

Mr. Edwin Walker gave a collection of 124 volumes, 1,050 pamphlets, 00 periodicals, comprising files of "Lucifer," "Mother Earth," "The al," "The Index," and other periodicals, also suffrage publications, medical nographs, etc. Mr. Robert Jaffray gave a collection of vocal and instru- ntal music (12 volumes, 15 pamphlets), including opera arias, Scottish tional Melodies, sacred music, etc. Mr. S. Janovici gave 24 volumes and pamphlets in French, German, and Roumanian, relating to the Rouma- n Jews, and other subjects. Mr. L. M. Stein, Chicago, gave 4 volumes and pamphlets, in Yiddish. Mr. Daniel Leonidov gave 8 volumes, 11 pam- lets, and 19 periodicals, in the Russian language. From Mr. Hermann uller, Upper Montclair, N. J., came 158 postage stamps of the Republic Hayti.

ADDITIONS AND USE OF THE LIBRARY IN APRIL, 1927

DURING the month of April, 1927, there were received at the Library 32,617 volumes and 21,886 pamphlets. (These include the additions both Reference and Circulation Departments.) The total number of ders recorded in the Central Building was 168,103. Visitors to the build- g numbered about 331,000.

NEW PERIODICALS

Alabama forest news. Montgomery, Alabama. Monthly.
Published by Alabama. — State Forestry Commission.

Alrededor del mundo. Madrid, Spain. Weekly.

Altorientalische Gesellschaft. Mitteilungen. Leipzig. Three times a year.

American produce grower. Chicago, Ill. Monthly.

Analytical digest. Chicago, Ill. Monthly.

Anti-clerical. Habana, Cuba. Monthly.
Published by the Federación anticlerical de Cuba.

Argentina. — Ministerio del Interior. Crónica informativa. Buenos Aires, Argentina. Monthly.

Art et technique. Paris. Monthly.
Supplement to *La Construction moderne.*

Asociación carbonera de Chile. Publicación. Valparaiso, Chile, S. A. Quarterly.

Atco fisheries news. New York. Monthly.
Published by the Atlantic Coast Fisheries Co.

Bashkirski krayevedcheski sbornik. Ufa, S.S.S.R. Irregular.
Published by the Obshchestvo po izucheniyu Bashkirii.

Belgium. — Administration des Mines. Les Industries minières et métallurgiques pendant le mois... Brussels, Belgium. Monthly.

Blaetter für Funkrecht. Berlin. Monthly.

Cahiers de la république des lettres, des sciences et des arts. Paris. Irregular.

Catholic University of America. — Education Department. Educational research bulletin. Washington, D. C. Monthly.

Cirenaica (province). Studi e monografie coloniali. Bengasi, Cirenaica, Italy. Irregular.

Columbia optometrist. New York. Quarterly.
Published by the Columbia University School of Optometry Alumni Association.

Communist. London. Monthly.
Organ of the Communist Party of Great Britain.

Cue. Canton, Mo. Quarterly.
Organ of the Theta Alpha Phi Fraternity.

Degel Israel. New York. Monthly.
Organ of the Federation of Orthodox Rabbis of America.

Denken en leven. Hilversum, Netherlands. Bi-monthly.

Deutsche Hochschule für Politik. Berichte. Berlin. Irregular.

Deutsche Illustrierte. Berlin. Weekly.

Dimineata. Bucharest, Roumania. Daily.

Duo-art monthly. New York. Monthly.
Published by the Aeolian Company.

Echo. Denver, Colorado. Monthly.
Published by the Motor Club of Colorado.

Einigkeit. New York. Weekly.
Published by the Unity Committee of the Joint Board Cloakmakers' Union, and Joint Board Furriers' Union.

Esprit international. Paris. Quarterly.
Published by the Carnegie Endowment for International Peace.

Fire. New York. Quarterly.

Forum Livii. Forli, Italy. Quarterly.

Forward view. York, England. Monthly.
Organ of the Yorkshire Council of Young Liberals.

Gazeta commercial. Juiz de Fóra, Brazil. Daily.
Published by the Associação commercial de Juiz de Fóra.

Haiti. — Département des Relations Extérieures. Bulletin officiel. Port-au-Prince, Haiti. Bi-monthly.

Hamburg, Germany.—Hamburgische Strafanstalten. Mitteilungen der Verwaltung. Hamburg, Germany. Irregular.

Hamburg, Germany. — Jugend- und Wohlfahrtsamt. Jugend und Volkswohl. Hamburg, Germany. Monthly.

Hamburg, Germany. — Ordinances. Hamburgisches Gesetz- und Verordnungsblatt. Hamburg, Germany. Irregular.

Hamburg. — Universität. Abhandlungen aus dem Mathematischen Seminar. Hamburg, Germany. Semi-annual.

Hamishoat. Jerusalem, Palestine. Monthly.

Industria italiana delle conserve alimentari. Parma, Italy. Monthly.
Published by the Reale stazione sperimentale per l'industria delle conserve alimentari.

Instytut Gospodarstwa Spolecznego. Sprawy robotnicze. Warsaw, Poland. Bi-monthly.

International Labour Office. Legislative series. Dominican Republic. Geneva, Switzerland. Irregular.

—— Legislative series. Guatemala. Geneva, Switzerland. Irregular.

—— Legislative series. Leeward Islands. Geneva, Switzerland. Irregular.

—— Legislative series. Trinidad and Tobago. Geneva, Switzerland. Irregular.

handlowa i przemyslowa we Lwowie. iadomosci gospodarcze. Lwów, Pond. Semi-monthly.

née parisienne. Paris. Daily.

gue of Nations. — Health Section. eekly record of reports regarding the evalence of certain epidemic diseases ceived by the Health Section. Geneva, witzerland. Weekly.

apis Belaruskava druku. Mensk, White ussia, U.S.S.R. Monthly.
ublished by White Russia. — Dzyarzhavna Bibliateka.

kedonska tribuna. Indianapolis, Ind. eekly.

ket for exchange. Boston, Mass. onthly.

nonite quarterly review. Goshen, Ind. uarterly.
ublished by Goshen College, Goshen, Ind.

higan. — Securities Commission. List securities. Lansing, Mich. Monthly.

nesota union advocate. St. Paul, Minn. eekly.
ublished by the Minnesota State Federation of Labor.

avská prirodovedecká společnost. race. Brno, Czechoslovakia. Irregular.

seum graphic. Los Angeles, Cal. i-monthly.
ublished by the Los Angeles Museum of History, Science and Art.

ional Broadcasting Company, Inc. Blue etwork publicity statement. New York. eekly.

Red network publicity statement. ew York. Weekly.

ional Laboratory of Psychical Research. roceedings. London. Irregular.

v South. Chattanooga, Tenn. Monthly.

derdeutsche Zeitschrift für Volkskunde. remen, Germany. Quarterly.

span. Bloemfontein, South Africa. eekly.

ific pulp and paper industry. Seattle, ashington. Monthly.

saic County Historical Society. [Publiation.] Paterson, N. J. Irregular.

ches. Philadelphia, Pa. Weekly.

rson's magazine. London. Monthly.

toon school. Washington, D. C. Quarrly.
ublished by the National Association for the Study of the Platoon or Work-Study-Play School Organization.

lic safety. Chicago, Ill. Monthly.
ublished by the National Safety Council.

Public Service Corporation of New Jersey. Library bulletin. Newark, N. J. Monthly.

Punikki. Superior, Wis. Semi-monthly.
Published by the Tyomies Society.

Queensland producer. Brisbane, Queensland. Weekly.

Radio trade-builder. Toronto, Ontario, Canada. Monthly.

Railroad amalgamation advocate. Chicago, Ill. Monthly.
Published by the International Railroad Amalgamation Committee.

Restaurant man. New York. Monthly.
Published by the United Restaurant Owners' Association.

Roierd. Montreal, Canada. Monthly.

Sexualpsychologischer Seminar. Arbeiten. Bonn a. Rh., Germany. Irregular.

Shepherd dog review. Allston, Mass. Monthly.
Organ of the Shepherd Dog Club of New England.

Sierra Club circular. San Francisco, Cal. Irregular.
Published by the Sierra Club.

Sociedad española de excursiones. Boletín. Madrid. Quarterly.

Society of Industrial Engineers. Bulletin. Chicago, Ill. Monthly.

Steam power. Chicago, Ill. Monthly.

Street railway bulletin. Boston, Mass. Monthly.
Published by the New England Street Railway Club.

Sunnudagsbladid. Reykjavik, Iceland. Semi-monthly.

Tidens Tegn. Oslo, Norway. Daily.

Town tidings. Buffalo, N. Y. Quarterly.
Published by the Town Club of Buffalo.

Travel log. London. Quarterly.
Published by the Workers' Travel Association.

Turkey. — Statutes. La législation turque. Constantinople, Turkey. Irregular.

United States. — Weather Bureau. Monthly meteorological summary with comparative data of New York. New York, N. Y. Monthly.

University of Tennessee. — Agricultural Experiment Station. Circular. Knoxville, Tenn. Irregular.

Vient de paraitre. Paris. Monthly.

Woman. London. Monthly.

Workers' herald. Cape Town, S. A. Monthly.
Organ of the Industrial and Commercial Workers' Union of Africa.

Yevraziĭskaya khronika. Clamart (Seine), France. Irregular.

GARDENS & GARDENING

A SELECTED LIST OF BOOKS PREPARED BY THE GARDEN CLUB OF AMERICA, THE HORTICULTURAL SOCIETY OF NEW YORK AND THE NEW YORK PUBLIC LIBRARY

To Accompany an Exhibition of Garden Books in the Central Building, March, 1927

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    - Japan
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    - South Africa
- BIOGRAPHIES
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PART II

HORTICULTURE, *continued*

TREES AND SHRUBS

Allen, Walter Fox. English walnuts; what you need to know about planting, cultivating and harvesting this most delicious of nuts. [Lawrenceville, N. J.: W. F. Allen,] cop. 1912. 16°. **VQK**

Arnold Arboretum. *See* **Harvard University.** — Arnold Arboretum.

Bacon, Francis. Sylva Sylvarum, sive Historia Naturalis, in decem centurias distributa. Lug[duni] Batavor[um]: F. Hackius, 1648. 12°. Reserve

Bailey, Liberty Hyde. The cultivated evergreens; a handbook of the coniferous and most important broad-leaved evergreens planted for ornament in the United States and Canada. New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1923. 8°. **VQT**

A practical descriptive book.

Blakeslee, Albert Francis, and C. D. Jarvis. Trees in winter; their study, planting, care and identification. New York: The Macmillan Company, 1926. 8°.

Practical advice for growing trees in the first part and botanical descriptions in the second half.

Cox, Euan Hillhouse Methven. Rhododendrons for amateurs. London: Country Life, Ltd., 1924. 12°. **VQH**

English.

Has lists of desirable species and information of simple and practical nature.

Dallimore, W. Holly, yew, & box; with notes on other evergreens. London: John Lane, 1908. 8°. **VQT**

English.

Davey, John. The tree doctor: the care of trees and plants. New York: The Saalfield Pub. Co. [cop. 1907.] 8°. **VQS**

With many excellent photographs of injurious ways of treating them. Also chapters on other subjects.

iculture, continued.

s and Shrubs, continued.

vis, Lucius D. Ornamental shrubs for
en, lawn, and park planting. New York:
Putnam's Sons, 1899. 4°. **VQS**

th an account of the origin, capabilities and
tion to cultivation in the United States of
ous varieties.

elyn, John. Sylva, Or a Discourse of
st-Trees, and the Propagation of Tim-
n His Majesties Dominions. As it was
er'd in the Royal Society the xvth of
ber, MDCLXII, upon occasion of certain
ries propounded to that Illustrious
mbly, by the Honourable the Principal
ers, and Commissioners of the Navy.
, a Philosophical Essay of Earth, being
cture in Course. To which is annexed
na: or, An Appendix concerning
-Trees in relation to Cider; The Mak-
nd several ways of Ordering it. Pub-
l by express Order of the Royal
ty. Also Kalendarium Hortense; or,
Gard'ners Almanac; Directing what he
do Monthly throughout the Year...
l Edition much Inlarged, and Improved
ohn Evelyn Esq; Fellow of the Royal
ty. London: Printed for John Martyn,
er to the Royal Society, 1679. f°.
lish. **†† VQS**

first book on the conservation of trees. In-
ng historically.

rvard University.—Arnold Arboretum.
tin of popular information. [Jamaica
, Mass., 1911–date.] 8°. **QEK**

information on seasonal bloom and habits of
and hardiness of the trees and shrubs in the
tum. A splendid reference work.

are, H. Flowering trees and shrubs.
on: A. L. Humphreys, 1902. 8°.
lish.

rnibrook, Murray. Dwarf and slow-
ng conifers. London: "Country Life,"
1923. 12°. **VQT**
lish.

cultural directions, but detailed descriptions
upon personal examinations and notes.

vis, C. D., joint author. *See* **Blakeslee,**
t Francis, and C. D. JARVIS.

eler, Harriet Louise. Our northern
s and how to identify them; a hand-
for the nature-lover. New York:
es Scribner's Sons, 1912. 8°.
***R – QFT**

nwood, John. A treatise of the lawes
forest. London: Printed for the So-
of Stationers, 1615. 4°. **Reserve**

thews, Ferdinand Schuvler. Field book
nerican trees and shrubs. New York:
Putnam's Sons [1915]. 16°.
MRR Desk

oncise description of the character and color of
common throughout the United States, to-
with maps showing their general distribution.

Michaux, André. Histoire des chênes de l'Amérique; ou, Descriptions et figures de toutes les espèces et variétés de chênes de l'Amérique Septentrionale, considérées sous les rapports de la botanique, de leur culture et de leur usage. Paris: Crapelet, 1801. f°. **†† VQT**

Michaux was a member of the National Institute of France and of the Charleston Society of Agriculture. He was sent out by the French government to collect American plants, some of which were described by him for the first time. Of historical interest.

Morris, Robert T. Nut growing. New York: The Macmillan Company, 1921. 12°. **VQT**

"Dr. Morris aims to show that nuts in their present improved forms and on grafted trees should be planted as freely as apple trees."

Pack, Charles Lathrop. Trees as good citizens. Washington, D. C.: The American Tree Association [cop. 1922]. 8°. **VQV**

The author is president of the Association. Pruning and care of trees, legal value of shade trees, etc.

Peets, Elbert. Practical tree repair; the physical repair of trees. Bracing and the treatment of wounds and cavities. New York: R. M. McBride & Company, 1925. rev. ed. 12°. **VQS**

The author is a graduate of the Harvard School of Landscape Architecture and the book is clear and practical.

Rehder, Alfred. Manual of cultivated trees and shrubs hardy in North America, exclusive of the subtropical and warmer temperate regions. New York: The Macmillan Company, 1927. 8°. **VQV**

Rogers, Julia Ellen. The tree book. New York: Doubleday, Page & Company, 1908. 4°. ***R – VQV**

A popular guide to a knowledge of the trees of North America and to their uses and cultivation.

Sargent, Charles Sprague. The silva of North America. Boston and New York: Houghton, Mifflin & Co., 1892–1902. 14 v. f°. **†† VQV**

Descriptions of the trees which grow wild in North America exclusive of Mexico.

Saunders, Charles Francis. Trees and shrubs of California gardens. Illustrated with photographs by the author. New York: R. M. McBride & Company, 1926. 8°. **VQV**

Author says this book ought to be called, "Familiar trees and shrubs of California gardens and waysides with particular reference to those not grown in the open in the northwest and the eastern United States." Written in popular fashion.

Simmons, James Raymond. The historic trees of Massachusetts. Boston: Marshall Jones Co., 1919. 8°. **VQV**

Tells about the old trees of Massachusetts and the historic events associated with them.

Solotaroff, William. Shade trees in towns and cities; their selection, planting, and care as applied to the art of street decora-

Horticulture, continued.

Trees and Shrubs, continued.

tion; their diseases and remedies. New York: John Wiley & Sons, 1911. 8°. **VQS**

Principally about trees in cities, their municipal control and supervision.

Wilson, Ernest Henry. America's greatest garden; the Arnold Arboretum...with frontispiece and fifty illustrations mostly by the author. Boston, Mass.: The Stratford Company, 1925. 8°. **QEK**

Mr. Wilson, second in command at the Arboretum and a great plant collector, writes most alluringly of the trees and shrubs in the Arboretum. He tells which ones will do well in cold climates, and describes many new introductions from Asia. The author has introduced more new plants to beautify our gardens than any other living person.

—— Aristocrats of the garden. Boston, Mass.: The Stratford Company, 1926. 8°.

Except for one chapter on lilies the book is devoted to the outstandingly beautiful vines, shrubs and trees.

—— The romance of our trees. Garden City, N. Y.: Doubleday, Page & Company, 1920. 8°.

Attractively written articles on some of our trees: the yew, lombardy poplar, horse chestnut, etc.

Wright, Walter Page. Garden trees and shrubs. London: Headley Bros. [1913.] 8°. **VQS**

English.

Deals not only with the newer kinds, but with the standard varieties also. Book beautifully illustrated in color.

Vines

Hottes, Alfred Carl. A little book of climbing plants, including a discussion of climbing roses, ground covers, trailers, arbors and trellises. New York: The A. T. De La Mare Company, Inc., 1924. 12°. (The "Little book" series.) **VQE**

A practical book.

McCollom, William C. Vines and how to grow them. Garden City, N. Y.: Doubleday, Page & Co., 1913. 12°. (Garden library.) **VQH**

A manual of climbing plants for flower, foliage and fruit effects, both ornamental and useful, including those shrubs and similar forms that may be used as vines.

Newhall, Charles Stedman. The vines of northeastern America. New York: G. P. Putnam's Sons, 1897. 8°. *** R – QFR**

Ferns

Clute, Willard Nelson. Our ferns in their haunts. New York: F. A. Stokes Co. [1901.] 8°. *** R – QEV**

A guide to all the native species.

Durand, Herbert. Wild flowers and ferns: in their homes and in our gardens. New York and London: G. P. Putnam's Sons, 1925. new ed. 12°.

Admirable descriptions, with directions for transplanting wild flowers to our gardens. Illustrated in halftone and color. One of the best books on this subject.

Woolson, G. A. Ferns and how to grow them. New York: Doubleday, Page & Co., 1910. 12°. (Garden library.) **VQH**

A good book on the life and habits of our ferns with cultural directions for indoors.

Wild Flowers

Armstrong, Margaret Neilson, and J. J. Thornber. Field book of western wild flowers. New York: G. P. Putnam's Sons [cop. 1915]. 12°. **QEG**

Blanchan, Neltje, pseud. *See* **Doubleday,** Nellie Blanchan De Graff.

Dana, Frances Theodora Smith. *See* **Parsons,** Frances Theodora Smith Dana.

Doubleday, Nellie Blanchan De Graff. Wild flowers worth knowing, adapted by Asa Don Dickinson from Nature's garden, by Neltje Blanchan [pseud.]. Garden City, N. Y.: Doubleday, Page & Company, 1917. 8°. (Worth knowing series.) **QEG**

A book of interest to children or adult beginners in nature.

Embury, Emma Catherine Manley. American wild flowers in their native haunts. New York: D. Appleton & Company, 1845. 8°. **NBF**

House, Homer Doliver. Wild flowers of New York, by Homer D. House, state botanist. Albany: The University of the State of New York, 1918. 2 v. f°. (New York State Museum. Memoir 15.) **† QFT**

A beautiful book with fine illustrations and descriptions of the wild flowers of New York.

Jefferies, Richard. The life of the fields. London: Chatto & Windus, 1892. 16°. **PQR**

English.

First published in 1884.

Contains "The Pageant of summer," a poetic prose essay for every lover of the out-of-doors. Other essays also.

iculture, continued.

Flowers, continued.

eeler, Harriet Louise. Our early wild
ers; a study of the herbaceous plants
ming in early spring in the northern
s; illustrated by Mary Keffer and
e P. Luquer. New York: Charles Scribner's
Sons, 1916. 16°. **QEG**

pocket size volume describing some 130 flowers
northern United States.

unsberry, Alice. A guide to the wild
ers. New York: F. A. Stokes Company
1899]. 12°. *** R – QEG**

scriptions of native wild flowers with very fine
rations.

athews, Ferdinand Schuyler. Field book
merican wild flowers. New York: G. P.
nam's Sons [cop. 1912]. 12°. **MRR Desk**

small handbook to slip into one's pocket before
for a walk in the fields and woods.

leehan, Thomas. The native flowers and
s of the United States. Boston: L.
ng & Co., 1879; Philadelphia, 1880. 4 v.
QFT

teresting historically and because of its beautiful
and good plates.

orthrop, Alice Rich. Through field and
dland; a companion for nature students;
ed by Oliver Perry Medsger, with 200
trations, some in color. New York &
don: G. P. Putnam's Sons, 1925. 8°.
PQI

handbook for the out-of-doors.

Parsons, Frances Theodora Smith Dana. How to know the wild flowers; a guide to the names, haunts, and habits of our common wild flowers. By Mrs. William Starr Dana. Illustrated by Marion Satterlee and Elsie Louise Shaw. New York: Charles Scribner's Sons, 1900. new ed. 8°. *** R – QEG**

Charming descriptions of wild flowers according to color.

Reed, Chester Albert. Flower guide, revised and with new illustrations; wild flowers east of the Rockies...with 320 pictures in color, painted by the author. Garden City, N. Y.: Doubleday, Page & Co., 1922. obl. 48°.

A convenient handbook for a walk. Describes and classifies the more common wild flowers.

Saunders, Charles Francis. Useful wild plants of the United States and Canada. New York: R. M. McBride & Co., 1920. 8°. *** R – QEN**

Treats of the edible roots, tubers, nuts, stems, etc., native to the United States and the various uses to which the wildlings can be put.

Thornber, J. J., joint author. *See* **Armstrong,** Margaret Neilson, and J. J. THORNBER.

Walcott, Mary Morris Vaux. North American wild flowers. v. 1–2. Washington, D. C.: The Smithsonian Institution, 1925–[26]. f°. **Reserve**

Lent by Mr. William Edwin Rudge.

BULB GARDENING

llen, C. L. Bulbs and tuberous-rooted
ts: their history, description, methods of
pagation and...culture in the garden,
lling and greenhouse. New York:
nge Judd Co., 1893. 12°. **VQH**

little old-fashioned, but with a good list and
ical cultural directions.

owles, Edward Augustus. A handbook
crocus and colchicum for gardeners.
don: Martin Hopkinson & Co., Ltd.,
. 8°. **VQH**

nglish.

good book on a subject on which little is written.

ampden, Mary. Bulb gardening. Illus-
ions in colour by Maud A. West, draw-
in line by the author. New York:
rles Scribner's Sons, 1922. 8°. (The
e garden books. no. 3.) **VQH**

as helpful suggestions on many phases of bulb
ing.

acob, Joseph. Daffodils. With eight
ured plates. New York: F. A. Stokes
[1910.] 8°. (Garden flowers in color.)
VQH

nglish.

xcellent and interesting and helpful, with classi-
ions, descriptions and cultural directions and an account of shows and how to prolong daffodil season in the garden.

—— Hardy bulbs for amateurs. London: Country Life, Ltd., 1924. 8°. (Country Life library.) **VQH**

English.

Very well written, thorough and helpful. Includes lists which are not grown by many and very well could be.

—— Tulips. With eight coloured plates. New York: F. A. Stokes Co. [pref. 1912.] 8°. (Garden flowers in color.) **VQH**

English.

"I have lingered longer upon its historical part, but to me the intellectual and cultural sides of its life are inseparable." Tells of culture and origin. Very helpful to Americans though English.

—— Tulpen hare geschiedenis, beschrijving en behandeling... Naar J. Jacob bewerkt door E. T. Witte. Amsterdam: Scheltema & Holkema [1912]. 8°. **VQH**

English.

A Dutch translation of a standard work. Interesting because the English was translated into Dutch.

Kirby, Arthur Martin. Daffodils, narcissus, and how to grow them as hardy

Horticulture, continued.

Bulb Gardening, continued.

plants and for cut flowers. New York: Doubleday, Page & Co., 1910. 12°. (Garden library.) **VQH**

A little old-fashioned, but with good descriptions and lists. Contains advice for growing them indoors and in all kinds of locations out of doors.

Lyall, Sophie, joint author. *See* **Silberrad,** Una Lucy, and Sophie Lyall.

Macself, Albert James. Bulb gardening. London: Thornton Butterworth, Limited [1925]. 8°. (The home garden books.) **VQH**

English.

By an eminent British horticulturist, whose ideas, however, are applicable in many things to this country's problems.

Sanders, Thomas William. Bulbs and their cultivation. London: W. H. & L. Collingridge [1908]. 12°.

English.

Silberrad, Una Lucy, and Sophie Lyall. Dutch bulbs and gardens, painted by Mima Nixon, described by Una Silberrad and Sophie Lyall. London: A. and C. Black, 1909. 8°. **VQG**

English.

A well-written book on methods of bulb growing in Holland. With comments on historical associations and accurate descriptions of the plants.

Tabor, Grace. Making a bulb garden. New York: McBride, Nast & Co. [1913.] [2. ed.] 16°. (House and garden making books.) **VQH**

Date on title-page 1912.

The lists are a little out of date, but the ideas are good.

Weathers, John. The bulb book; or, Bulbous and tuberous plants for the open air, stove, and greenhouse. New York: E. P. Dutton and Company, 1911. 8°. **VQH**

An encyclopedia of bulbs, giving their botanical classification and full descriptions, emphasizing especially native conditions. It is a valuable compilation, listing all the species and varieties known at the time.

Weston, Thomas A. Bulbs that bloom in the spring. New York: A. T. De La Mare Company, Inc., 1926. 12°. **VQH**

All about the hardy bulbs and their successful cultivation.

Herbs and Herbals

Apuleius. The Herbal of Apuleius Barbarus, from the early twelfth-century manuscript formerly in the abbey of Bury St. Edmunds (ms. Bodley 130). Described by Robert T. Gunther. Oxford: Printed for presentation to the members of the Roxburghe Club, 1925. 4°. **Reserve**

Arber, Agnes. Herbals, their origin and evolution. Cambridge: University Press, 1912. 8°. **QEB**

English.

With a chapter on the history of botany, 1470–1670.

Barton, William P. C. Vegetable materia medica of the United States. Philadelphia: H. C. Carey and I. Lea, 1818–25. 2 v. 4°. **QEN**

A botanical, general and medical history of medicinal plants indigenous to the United States. Illustrated with colored engravings made after drawings done from nature by the author. Useful to this day.

Brunschwig, Hieronymus. The vertuose boke of distyllacyon of the waters of all maner of herbes...fyrst made and compyled by the thyrte yeres study and labour of... Master Jherom Bruynswyke and now newly translate out of Duyche into Englyssche. Imprinted at London by me Laurens Andrewe, 1527. f°.

Lent by The Pierpont Morgan Library.

Commelin, Jan. Horti medici Amstelodamensis rariorum tam Orientalis quam Occidentalis Indiæ aliarumque peregrinarum plantarum...descriptio et icones... Latinitate donatum...à Frederico Ruyschio & Francisco Kiggelario. Amstelodami, 1697–1701. 2 v. f°. **†† QEK**

Pars altera by Casparus Commelin.

An example of the fine books published at this period on botany. In Latin and Dutch.

Dioscorides, Pedacius. De Medicinali Materia. Basle, Operinus, 1555.

Lent by The Pierpont Morgan Library.

Dodoens, Rembert. A nievve herball; or, Historie of plantes... First set foorth in the Doutche or Almaigne tongue...and now first translated out of French into English, by Henry Lyte. London, G. Dewes, 1578. f°.

Lent by The Pierpont Morgan Library.

Erbolario o Distinta delle Erbe. 1734. 12°.

Title taken from the binding.

A collection of plates of various plants.

Lent by Mr. Richardson Wright.

Gerard, John. The Herball Or Generall Historie of Plantes. Imprinted at London by Iohn Norton, 1597. f°.

English.

Lent by Mrs. Mortimer J. Fox.

Hampton, Frank Anthony. The scent of flowers and leaves; its purpose and relation to man. London: Dulau & Co., Ltd., 1925. 12°. **QEG**

English.

A scientific explanation of smell, the least understood of our senses.

rticulture, continued.

bs and Herbals, continued.

arding, Arthur Robert. Ginseng and er medicinal plants. Columbus, O.: A. Harding Publishing Co. [cop. 1908.] rev. 12°. **QEN**

reats of growing ginseng commercially.

erbal. Mainz, Schoeffer, 1484. 4°.

ent by The Pierpont Morgan Library.

ortus Sanitatus. Strassburg, Reuss, 7. f°.

ent by The Pierpont Morgan Library.

erome of Brunswick. *See* **Brunschwig,** ronymus.

ains, Maurice Grenville. Culinary herbs; r cultivation, harvesting, curing and s. New York: Orange Judd Company, 2. 12°. **VQH**

ow to bring the garden flowers into the kitchen. actical book.

attioli, Pietro Andrea. I Discorsi...di acio Dioscoride... Vinegia: Valgeisi, 7. f°.

ent by Mr. Richardson Wright.

onardes, Nicolás. Ioyfvll newes out of new-found vvorlde wherein are declared, rare and singuler vertues of diuers bs, trees, plantes, oyles & stones. Lon-, Printed by E. Allde, by the assigne 3. Norton, 1596. 4°. **Reserve**

arkinson, John. Paradisi In Sole Parais Terrestris. [Colophon: London, nted by Hvmfrey Lownes and Robert Yovng at the signe of the Starre on Bread-street hill. 1629.] f°.

English.

A reference book of great value for all students of gardening history.

Lent by Mrs. Mortimer J. Fox.

—— Paradisi in sole. Paradisus terristris. Faithfully reprinted from the edition of 1629. London: Methuen & Co., 1904. f°.

English. **†† VQD**

—— Theatrum botanicvm: the theater of plants. Or, An herball of a large extent... London, Printed by T. Cotes, 1640. f°.

English.

Lent by Mrs. Mortimer J. Fox.

Pierre de Crescentius. Manuscript. (Morgan ms. no. 232.)

Lent by The Pierpont Morgan Library.

The **Queen's** Closet opened: incomparable secrets in Physick, Chirurgery, Preserving, Candying and Cookery, as they were presented to the Queen. Transcribed from the true copies of her Majesties own receipt books, by W. M., one of her late servants. [A Queen's Delight, or the art of preserving.] London, 1655. 12°.

Rohde, Eleanour Sinclair. A garden of herbs. London: P. L. Warner [1920?]. 8°.

English. **VTI**

A practical handbook to the making of an old English herb garden, together with numerous receipts from contemporary authorities.

Scott, Reginald. A Perfite platforme of a Hoppe Garden, and necessarie Instructions for the making and mayntenaunce thereof ... London: Imprinted by Henrie Denham, 1574. 4°. **Reserve**

LAWNS

arron, Leonard. Lawn making, together n the proper keeping of putting greens. den City, N. Y.: Doubleday, Page & npany, 1923. 8°. (The Amateur's book he garden series.) **VQE**

Ir. Barron has been for many years editor of the *en magazine,* now *Garden and home builder,* and peaks with authority. Tells how to make, feed, e, etc.

Doogue, Luke Joseph. Making a lawn. New York: McBride, Nast & Company, 1912. 16°. (House and garden making books.) **VQE**

Tells about making over old lawns, treatment of large areas, grass, seed, etc. A small practical treatise.

ROCK AND ALPINE, WALL AND WATER GARDENS

rber, Edward Alexander Newell. Plant in Alpine Switzerland. London: John rray, 1910. 8°. **QFC**

nglish.

n account in simple language of the natural ry of alpine plants. The author is demonstrator alaeobotany at Trinity College, Cambridge. Has ters on the plants of the alpine meadows and ares, high alpine plants, the marsa plants of the , alpine thickets and forests. Popular and boal descriptions.

Bisset, Peter. The book of water gardening. New York: A. T. De La Mare Company, Inc. [cop. 1924.] 4°. **VQG**

Gives in full detail the practical information helpful to the selection, grouping and successful cultivation of aquatic and other plants required to make a water garden. Also discusses surroundings, etc., covering all conditions from an amateur's requirements to the large estate or park.

Brown, Stewardson. Alpine flora of the Canadian Rocky Mountains... Illustrated with water-colour drawings and photo-

Horticulture, continued.

Rock and Alpine, Wall and Water Gardens, continued.

graphs by Mrs. Charles Schäffer. New York and London: G. P. Putnam's Sons, 1912. 12°.

Conard, Henry Shoemaker, and H. T. A. Hus. Water-lilies and how to grow them. New York: Doubleday, Page & Co., 1907. 12°. (Garden library.) VQH

Cultural directions, classification, trade aspects. Written by men with practical scientific acquaintance of the subject.

Correvon, Henry, and Philippe Robert. The Alpine flora. London: Methuen & Co., 1926.

Discusses the characteristics of alpine plants, acclimatization and garden culture. Has 100 full-page color plates.

Cotter, Sir James Laurence. A simple guide to rock gardening. London: The Sheldon Press [1926]. 12°. VQG

English.

Farrer, Reginald John. Alpines and bog-plants. London: E. Arnold, 1908. 12°. VQG

English.

Treats of shrubs, mostly evergreen, and of some bog-loving plant families, ivies, greater and smaller bog plants, and the water garden.

—— Among the hills: a book of joy in high places. London: Headley Brothers [1910]. 8°. PSO

English.

An account of travels in the Graian and Maritime Alps by an enthusiastic climber and lover of alpine plants, which he describes in their natural surroundings.

—— The English rock-garden. London: T. C. & E. C. Jack, Ltd., 1919. 2 v. 8°. VQG

English.

This well-known author's most important work.

—— In a Yorkshire garden. London: E. Arnold, 1909. 8°. VQG

English.

—— My rock-garden. London: E. Arnold, 1913. 12°. VQG

English.

Mr. Farrer has the gift of describing plants so vividly that one actually sees them. Each of his garden books is a delight for its style as well as its contents.

—— On the eaves of the world. London: E. Arnold, 1917. 2 v. illus. 8°. *R-BDS

English.

An account of two years spent in China and Thibet in the search for rare flowers. Mr. Farrer has a delightful style and it is interesting to learn of the flowers in their native habitat.

Flemwell, George. The flower-fields of Alpine Switzerland; an appreciation and a plea, painted and written by George Flemwell. New York: Dodd, Mead and Co., 1912. 8°. QFC

With an introduction by Henri Correvon. Beautiful pictures by one who has lived in Switzerland and seen the flowers.

Hus, H. T. A., joint author. *See* **Conard,** Henry Shoemaker, and H. T. A. Hus.

Jekyll, Gertrude. Wall and water gardens. London: G. Newnes [1902?]. 2. ed. 8°. (The "Country Life" library.) VQG

English.

Tells about dry walled terraces, rock gardens, streams, marshes, pools, ponds, etc.

Jenkins, E. H. The rock garden. London: Country Life, Ltd., 1920. [new ed.] 8°. VQE

English.

Has accounts of bog or rock gardens; pool, town or country rock gardens; propagation of alpines; alpines for shade or sun; bulbous and tuberous rooted plants and shrubs, ferns, etc., for rock gardens. Many planting tables.

Macself, Albert James. Alpine plants. Illustrated with colour photographs by R. A. Malby, water colour drawings by Winifred Walker, line drawings by G. E. Lee. New York: Charles Scribner's Sons, 1923. 8°. (The "home garden" books.)

English.

Meredith, Lewis B. Rock gardens; how to make and maintain them. With an introduction by Sir F. W. Moore. New York: Charles Scribner's Sons, 1914. 2. ed. 8°.

English.

Methuen, Sir Algernon Methuen Marshall, 1st bart. An alpine A B C and list of easy rock plants. New York: E. P. Dutton and Co. [1922.] 16°. VQG

English.

A small volume with good lists of alpines.

Robert, Philippe, joint author. *See* **Correvon,** Henry, and Philippe Robert.

Robinson, William. Alpine flowers for gardens; rock, wall, marsh plants, and mountain shrubs. London: John Murray, 1910. 4. ed. 8°. VQG

English.

First published in 1870.

The book aims to dispel the erroneous idea that plants of Alpine regions cannot be grown in gardens. Has an alphabetical list at the end of the book telling of each plant individually.

Sanders, Thomas William. Rock gardens and alpine plants. London: W. H. & L. Collingridge [1922]. 3. ed. 8°.

English.

A practical guide to the building and maintenance of various kinds of rockeries in all kinds and sizes of gardens.

Schroeter, Carl Joseph. Das Pflanzenleben der Alpen. Zürich: A. Raustein, 1926. 2. ed. 8°. QFC

With diagrams of altitudes and exposures and all kinds of graphs and charts. Climate by altitude and detailed botanical descriptions of alpines. A most valuable book for the rock gardener.

ticulture, continued.

and Alpine, Wall and Water Gardens, continued.

homas, Harry Higgott. Rock gardening amateurs, bv H. H. Thomas, assisted S. Arnott. London: Cassell and Co., , 1914. 8°. **VQD**

nglish.

mple directions for the making of large and rock gardens.

hompson, Harold Stuart. Alpine plants urope. London: G. Routledge & Sons, ; New York: E. P. Dutton & Co. [1911.]

nglish.

ith colored plates.

—— Sub-Alpine plants: flowers of the ss woods and meadows. New York: . Dutton & Co., 1912. 8°.

nglish.

ricker, William. The water garden. York: A. T. De La Mare Printing and lishing Co., 1897. 4°. **VQG**

nbraces the construction of ponds, the adaptation tural streams, planting, hybridizing, seed saving, propagation, building of an aquatic house, wintering, correct designing, planting of banks and margins, together with cultural instructions for all ornamental aquatics.

Wilder, Louise Beebe. Adventures in my garden and rock garden. Garden City, N. Y.: Doubleday, Page & Company, 1923. 8°. **VQG**

By an authority on rock gardens who writes from her own experience.

Wilson, Ernest Henry. A naturalist in western China, with vasculum, camera, and gun; being some account of eleven years' travel, exploration and observation in the more remote parts of the Flowery Kingdom. London: Methuen & Co., Ltd. [1913.] 2 v. 8°. ***R–BEM**

American.

An account of the author's explorations in the search for new plants.

Wright, Walter Page. Alpine flowers and rock gardens. New York: Dodd, Mead & Co., 1925. [3. ed.] 8°. **VQG**

English.

Chapters on alpine plants at home. Cultural characteristics and habits. Individual plants selected and described. The book has beautiful color plates.

PESTS AND FERTILIZERS

gee, Alva. Right use of lime in soil rovement. New York: Orange Judd npany, 1919. 12°. **VPH**

ow to test for acidity and how to apply lime.

uckle, Philip, joint author. *See* **Wardle,** ert Arnold, and ROBERT BUCKLE.

uckman, Harry O., joint author. *See* **n,** Thomas Lyttleton, and others.

hupp, Charles. Manual of vegetable-len diseases. New York: The Macmillan npany, 1925. 8°. (The rural manuals.) **VPM**

ritten for the commercial grower in a serious on.

elt, Ephraim Porter. Manual of tree and b insects. New York: The Macmillan npany, 1924. 12°. (The rural manuals.) **QIP**

general account of the more important or com- insects attacking shade and forest trees and s and woody ornamentals. The author is State mologist of New York.

ippin, Elmer O., joint author. *See* **Lyon,** mas Lyttleton, and others.

yon, Thomas Lyttleton, and others. s, their properties and management, by Lyttleton Lyon, Elmer O. Fippin, Harry Buckman. New York: The Macmillan npany, 1918. 12°. (The rural text-book es.) **VPH**

ritten by Cornell professors. Used as a text on the subject.

acself, Albert James. Soils and fer-ers. New York: Charles Scribner's Sons 5]. 8°. (The home garden books.) **VPH**

nglish.

Sanderson, Ezra Dwight. Insect pests of farm, garden and orchard. New York: John Wiley & Sons, 1912. 8°. ***R–QIP**

Taubenhaus, Jacob Joseph. Diseases of truck crops and their control. New York: E. P. Dutton & Company [cop. 1918]. 8°.

Van Slyke, Lucius Lincoln. Fertilizers and crops. New York: Orange Judd Company, 1919. 8°. **VPH**

A comprehensive and authoritative explanation of the why and how of crop feeding — the crops including flowering plants.

Voorhees, Edward Burnett. Fertilizers. Second revised edition by Sidney B. Haskell. New York: The Macmillan Company, 1926. 12°. (The rural science series.) **VPH**

The source, character and composition of natural, home-made and manufactured fertilizers and suggestions as to their use for definite crops and conditions.

Wardle, Robert Arnold, and PHILIP BUCKLE. The principles of insect control. Manchester: The University Press, 1923. 8°. (Victoria University, Manchester, England. Publications. no. 155.) **QIP**

English.

By two English professors. Gives formulae of the various spray mixtures.

Weed, Clarence Moores. Insects and insecticides. A practical manual concerning noxious insects and the methods of preventing their injuries. New York: Orange Judd Company, 1895. 2. (rev.) ed. 12°.

PLANT BREEDING

Bailey, Liberty Hyde. Plant-breeding, by L. H. Bailey. New edition, revised by Arthur W. Gilbert. New York: The Macmillan Company, 1915. 12°. (The rural science series.) **QEI**

About mutations, heredity, and other facts necessary to the plant breeder.

Coulter, John Merle. Fundamentals of plant-breeding. New York: D. Appleton and Co., 1914. 12°. ***R-QFI**

Darwin, Charles. The different forms of flowers on plants of the same species. New York: D. Appleton and Company, 1877. 12°. **QEP**

English.

—— The effects of cross and self fertilisation in the vegetable kingdom. New York: D. Appleton and Company, 1877. 12°. **QEL**

English.

By a great scientist. All gardeners should read Darwin even if they do not understand it all.

Drinkwater, Harry. A lecture on Mendelism. London: J. M. Dent & Sons, Ltd., 1910. 8°. **QAW**

English.

A clear presentation of an important but not widely understood law of plant heredity.

Harwood, William Sumner. New creations in plant life. New York: The Macmillan Company; London: Macmillan & Co., Ltd., 1918. 2. ed. 8°. ***E-QEI**

An authoritative account of the life and work of Luther Burbank.

Hottes, Alfred Carl. Practical plant propagation; an exposition of the art and science of increasing plants as practiced by the nurseryman, florist and gardener. New York: A. T. De La Mare Company, Inc., 1925. [2. ed.] 12°. **VQD**

Kains, Maurice Grenville. Plant propagation, greenhouse and nursery practice. New York: Orange Judd Company, 1916. 8°. **VQD**

Punnett, Reginald Crundall. Mendelism. London: Macmillan & Co., Limited, 1922. 6. ed. 12°.

English.

Perhaps the simplest of all explanations of this theory.

Vries, Hugo de. Plant breeding. Comments on the experiments of Nilsson and Burbank. Chicago: The Open Court Publishing Co., 1907. 8°. **VQD**

By a famous worker in this field. Simply written.

—— Species and varieties; their origin by mutation. Lectures delivered at the University of California. Edited by D. T. MacDougal. Chicago: Open Court Pub. Co., 1905. 8°. **QAS**

By the great scientist whose theories about mutation every gardener ought to know.

INDOOR GARDENING

Averill, Mary. Japanese flower arrangement (Ikebana) applied to western needs. New York: Dodd, Mead and Company, 1922. 8°.

Tells how to make the different Japanese flower arrangements according to varying seasons, the tools and receptacles, and the philosophy and symbolism back of it. Excellent illustrations in the Japanese manner.

Barnes, Parker Thayer. House plants and how to grow them. New York: Doubleday, Page & Co., 1910. 12°. (Garden library.) **VQF**

A simple, readable presentation of the practical problems of growing plants in the home.

Dorner, Herman B. Window gardening. Indianapolis: The Bobbs-Merrill Co. [1908.] 12°. **VQF**

On growing plants in a window garden.

Findlay, Hugh. House plants, their care and culture. New York: D. Appleton and Co., 1916. 8°. **VQF**

Jekyll, Gertrude. Flower decoration in the house. London: "Country Life," 1907. 8°. ("Country Life" library.) **MLO**

English.

On the use of flowers in house decoration. Lists hardy flowers available month by month. A book of practical suggestions.

Rexford, Eben Eugene. Indoor gardening. Philadelphia & London: J. B. Lippincott Company, 1910. 8°. **VQF**

Information for the amateur gardener by one who for many years was connected with the floricultural departments of prominent magazines.

Rockwell, Frederick Frye. Gardening under glass; a little book of helpful hints written particularly for those who would extend their gardening joys around the twelve-month. Garden City, N. Y.: Doubleday, Page & Company, 1923. 8°. **VQF**

Rowles, William F. The garden under glass, with numerous practical diagrams from drawings by G. D. Rowles. Philadelphia: J. B. Lippincott Company, 1917. 12°. **VQF**

English.

iculture, continued.

r Gardening, continued.

ft, Levi Rawson. Greenhouse management. New York: Orange Judd Company, 12°. **VQF**

e details of greenhouse construction, heating and ement and the handling of various crops in Primarily for the commercial grower, but written and informative for any plant grower.

hite, Edward Albert. The principles oriculture. New York: The Macmillan Company, 1915. 12°. (The rural text-book series.) **VQG**

By the head of the Department of Floriculture at Cornell University. Covers all aspects of the growing and marketing of flower crops.

—— Principles of flower arrangement. New York: The A. T. De La Mare Company, Inc., 1926. 8°.

The joy of growing flowers is enhanced when one can secure full success in arranging them. This book tells how to do so and explains the principles underlying the art.

GARDENING FOR CHILDREN

ewer, G. W. S. Educational school ening and handwork. With an intro- on by the Rt. Hon. Henry Hobhouse. bridge: University Press, 1913. 12°. **STC**
glish.

e author is a fellow of the Royal Horticultural y and a member of the Somerset County Edu- Committee.

ucational school gardening from the English of view. Discusses nature study, experimental in gardens, and the making of woodwork and work by school manual training classes to be n gardens.

nerson, Philip, joint author. *See* **Weed,** ence Moores, and PHILIP EMERSON.

tter, Lucy R. School gardening for children. With an introduction by... ick Geddes. London: G. Allen & Co., 1906. 12°. **SSI**
glish.

aim is to show the place of nature study in rgarten and school. It makes the garden the l point of the school work.

Meier, William Herman Dietrich. School and home gardens. Boston: Ginn and Co. [1913.] 12°. **VQD**

Can be used as a text-book for schools and also as a handbook for the home gardener. Practical.

Parsons, Henry Griscom. Children's gardens for pleasure, health, and education. New York: Sturgis & Walton Co., 1912. 12°. **VPE**

A book by the son of the founder of the first children's school farms in New York City. Tells how to prepare and lay out the ground and how to instruct and control children in gardens of from 20 to 500 plots. Practical and instructive.

Weed, Clarence Moores, and PHILIP EMERSON. The school garden book. New York: Charles Scribner's Sons, 1911. 12°. **VQE**

A practical handbook for school gardens by Mr. Weed, of the State Normal School, Lowell, Mass., and Mr. Emerson of the Cobbet Grammar School, Lynn, Mass. Indoor and outdoor gardens, school exhibits, gardening for profit, the garden month by month.

AGRICULTURE

GENERAL WORKS

to. *See* **Roman** farm management.

hamel du Monceau, Henri Louis. A tical treatise of husbandry: wherein are ained, many useful and valuable experi- ts and observations in the new hus- ry, collected during a series of years... I. Duhamel du Monceau... Also the approved practice of the best English ers, in the old method of husbandry. don: J. Whiston and B. White, 1759. **VPC**
ench.

is book shows the inquiring spirit of the earlier rs and their attitude toward farming. Is in- ing because of its historical value.

arrison, Fairfax, editor. *See* **Roman** management.

artlib, Samuel. Samuel Hartlib, his cie; or, An enlargement of the dis- se of husbandry, used in Brabant and Flaunders. London: H. Hills, 1651. 12°. **Reserve**

Heresbach, Conrad. The whole art and trade of husbandry, contained in foure bookes. [By Conrad Heresbach.] Enlarged by Barnaby Googe. London: Printed by T. S. for Richard More, 1614. 4°. **Reserve**

King, Franklin Hiram. Farmers of forty centuries; or, Permanent agriculture in China, Korea, and Japan. Madison, Wis.: Mrs. F. H. King, 1911. 12°. **VPW**

About the utilization of waste to good advantage in Asia, with other interesting facts about agricultural practices in that part of the world. Full of suggestions to be followed.

Liger, Louis. Oeconomie générale de la campagne, ou Nouvelle maison rustique. Amsterdam: Henri Desbordes, 1701. 2 v. in 1. 2. ed. 4°. **VPC**

Roman farm management; the treatises of Cato and Varro done into English, with

Agriculture, continued.
General Works, continued.

notes of modern instances, by a Virginia farmer [F. H., i. e. Fairfax Harrison]. New York: The Macmillan Company, 1913. 12°. **VP**

Historically interesting and has practical suggestions for present day farmers.

Varro. *See* **Roman** farm management.

Young, Arthur. A six months tour through the north of England, containing an account of the present state of agriculture ... London, 1770–71. 4 v. 2. ed. 8°.

English.

FRUITS

Austen, Ralph. A treatise of fruit-trees, shewing the manner of grafting, planting, pruning, and ordering of them in all respects. Oxford, Printed by H. Hall for T. Robinson, 1657. 2. ed. 4°.

English.

Quaint and interesting historically.

Bailey, Liberty Hyde. The pruning-manual. New York: The Macmillan Company, 1916. 12°. (The rural manuals.) **VQD**

A text-book of pruning and budding, grafting, mending, and training fruit trees, vines, and street trees.

Budd, Joseph Lancaster, and N. E. Hansen. American horticultural manual. New York: John Wiley & Sons, Inc., 1911–14. 2 v. 12°. **VQD**

Part 1. Comprising the leading principles and practices connected with the propagation, culture, and improvement of fruits, nuts, ornamental trees, shrubs, and plants in the United States and Canada.

Part 2. Systematic pomology. Containing descriptions of the leading varieties of the orchard fruits, grapes, small fruits, subtropical fruits, and the nuts of the United States and Canada.

Cotton, Charles. The planters manual; being instructions for the raising, planting, and cultivating all sorts of fruit-trees. London: H. Brome, 1675. 8°. **VQM**

Fraser, Samuel. American fruits, their propagation, cultivation, harvesting and distribution. New York: Orange Judd Publishing Company, 1924. 8°. **VQK**

A concise survey of a big subject by a student and practical fruit grower.

Hansen, N. E., joint author. *See* **Budd,** Joseph Lancaster, and N. E. Hansen.

Kains, Maurice Grenville. The principles and practice of pruning. New York: Orange Judd Company, 1917. 8°. **MQK**

Mr. Kains was formerly lecturer on horticulture at Columbia University. Treats of the pruning of young trees, nursery stock and mature trees, cure and prevention of injuries, care of top-worked trees, tree surgery, and the rejuvenation of neglected trees. It deals mostly with fruit and grapes, with some information on pruning ornamental trees and shrubs.

La Quintinie, Jean de. The compleat gard'ner; or, Directions for cultivating and right ordering of fruit-gardens and kitchen-gardens; with divers reflections on several parts of husbandry. Made English by John Evelyn. London: Printed for M. Gillyflower, 1693. f°.

French.

An English translation of a famous book about the vegetable and fruit garden of Louis XIV, which still exists at Versailles, and is now the French College of Horticulture. Much of the information is still valuable.

Lent by Mrs. Mortimer J. Fox.

—— Instructions pour les jardins fruitiers et potagers. Paris: C. Barbier, 1690. 2 v. 4°.

French.

Lent by Mrs. Mortimer J. Fox.

VEGETABLES

Bailey, Liberty Hyde. The forcing-book. New York: Macmillan Company, 1897. 16°. (Garden-craft series.) **VQF**

A manual of the cultivation of vegetables in glass houses. Not a new book but still a standard, authoritative work.

Findlay, Hugh. Practical gardening. New York, London: D. Appleton and Company, 1918. 8°. **VQI**

Deals with vegetables and fruits. Helpful hints for the home garden. Common mistakes and how to avoid them. Tables for when to plant, depth and time to transplant. Vegetables for the small and large garden. Succession planting.

French, Allen. The book of vegetables and garden herbs. New York: The Macmillan Company; London: Macmillan & Co., Ltd., 1911. 8°. **VQI**

A practical handbook and planting table for the vegetable gardener.

Giles, Dorothy. The little kitchen garden. Boston: Little, Brown and Company, 1926. 12°. (The little garden series.) **VQI**

A practical small book on vegetables, fruits and flowers. Charmingly written.

Randolph, John. A treatise on gardening, by a citizen of Virginia, John Randolph, Jr. (1727–1784) reprinted from the American gardener of John Gardiner and David Hepburn, 3d ed., 1826; edited by M. F. Warner. Richmond: Reprinted by Appeals *riculture, continued.*

getables, continued.

ss, Inc., for the William Parks Club, 4. 8°. (William Parks Club publications. 2.) **VQE**

treatise on some vegetables from the author's erience, with information derived from his reading. ook by one of the important men of the early ory of the United States.

elden, Charles Albert. Everyman's gar- every week. New York: Dodd, Mead Co., 1914. 12°. **VQD**

ne of the most readable and valuable books on etable gardening.

Vilmorin-Andrieux et Compagnie. The vegetable garden... English edition published under the direction of W. Robinson. London: John Murray, 1920. 3. ed. 8°. **VQI**

French.

Description and culture of the garden vegetables of cold and temperate climates by the great French horticultural firm.

Wilkinson, Albert Edmund. Muck crops. New York: Orange Judd Company, 1916. 12°. **VQI**

A book on vegetable crops raised on reclaimed land, known in some localities as black dirt or muck. The author is an instructor at the New York State College of Agriculture.

GARDENING AS AN ART

Design in the Garden

ndré, Édouard. L'art des jardins. Traité éral de la composition des parcs et jars. Paris, 1879. 4°. **† MSD**

rench.

or the serious student of landscape design. M. ré was landscape gardener of the outskirts of Paris editor of *L'Illustration horticole.*

ndrouet du Cerceau, Jacques. Livre chitecture. Paris: imprim. pour J. Anuet Du Cerceau, 1582. f°.

rench.

facsimile reprint.

ontains plans and sketches of the chateaux and ens existing in France at the time.

ent by Mrs. Mortimer J. Fox.

acon, Francis. The essayes or counsels ll and morall. London: J. Beale, 1639. **Reserve**

lomfield, Sir Reginald Theodore. The nal garden in England. With illustras by F. Inigo Thomas. London: Macdan and Co., Ltd., 1901. [3. ed.] 12°. **VQG**

nglish.

he work refers particularly to the formal design e garden in England, and its absolute separation landscape gardening.

urnap, George Elberton. Parks, their ign, equipment and use...with an introtion by Richard B. Watrous. Philadel: J. B. Lippincott Co., 1916. 4°. **MSD**

he author was formerly Landscape Architect of lic Buildings and Grounds, Washington, D. C. illustrations are of every type and for every ose, showing parks in many lands. The text ests uses of parks and landscape treatment of

ridland, Robert B. Practical landscape dening. New York: A. T. De La Mare npany, 1926.

simple practical guide to the landscaping and ting of the moderate priced and smaller home nds. Illustrated with views, diagrams and plans.

Dean, Ruth. The livable house; its garden. New York: Moffat, Yard and Co., 1917. 4°. **MSD**

Miss Dean is a well-known landscape architect and the book is most helpful. An exposition of general principles. Has chapters on The grounds as a whole, General planting, Flower gardens, Times and seasons, and Garden architecture. Many plans and illustrations.

Dezallier d'Argenville, Antoine Joseph. La théorie, et la pratique du jardinage... La Haye: J. M. Husson, 1739. 3. ed. 4°. **VQD**

Dillistone, George. The planning & planting of little gardens, with notes and criticisms by Lawrence Weaver. London: "Country Life," Ltd., 1920. 8°. **VQG**

English.

Plants and planting places for a small garden, giving plans submitted in a competition.

Downing, Andrew Jackson. A treatise on the theory and practice of landscape gardening, adapted to North America; with a view to the improvement of country residences... With remarks on rural architecture. New-York: Wiley and Putnam, 1841. 8°. **3 - MSD**

By one of the first American landscape architects.

Elwood, Philip H., Jr., editor. American landscape architectvre. New York: The Architectvral Book Pvblishing Co., Inc. [cop. 1924]. f°.

Estienne, Charles, and JEAN LIÉBAULT. Maison Rustique, Or The Covntrie Farme. London: Printed by Edm. Bollifant, for Bonham Norton, 1600. 4°. **Reserve**

Fallon, John Tiernan. How to make concrete furniture and accessories. New York: R. M. McBride & Co., 1917. 4°. **MSF**

Tells how to make garden walls, steps, sun-dials, benches, swimming pools, and pottery.

Gardening as an Art, continued.

Design in the Garden, continued.

Ferree, Barr. American estates and gardens. New York: Munn & Co., 1906. f°. †MQWO

Author was corresponding member of the American Institute of Architects and of the Royal Institute of British Architects. Photographs accompanied by descriptive text of homes in both the eastern and western portions of the country.

Forestier, Jean C. N. Gardens; a notebook of plans and sketches, translated from the French by Helen Morgenthau Fox. New York, London: Charles Scribner's Sons, 1924. f°. †MSK

French.

The author is a famous French landscape architect and has made plans for treating the small property and given a few of his Spanish gardens and some of those of southern France. All the designs are formal.

Garden colour. Spring, by Mrs. C. W. Earle. Summer, by E. V. B. Autumn, by Rose Kingsley. Winter, by the Hon. Vicary Gibbs. Notes and water colour sketches by M. Waterfield. London: J. M. Dent & Co., 1905. 4°. VQG

English.

A lovely looking book, applicable in a general way to American conditions.

Gardner, John Starkie. English ironwork of the xviith & xviiith centuries. London: B. T. Batsford [1911]. 4°. MNK

English.

An historical and analytical account of the development of exterior smithcraft. Has beautiful pictures of fences and gates.

Hamblin, Stephen Francis. Book of garden plans. Garden City, N. Y.: Doubleday, Page & Co., 1916. 4°. MSD

Planting lists for plans, rock gardens, fragrant flowers, annual gardens, wild planting, artificial water gardens, naturalistic water gardens are among the subjects discussed. A good beginner's book.

—— Lists of plant types for landscape planting. Cambridge: Harvard University Press, 1923. 4°. *R-VQE

The materials of planting for ornament listed according to their various uses. A source book of great use to anyone who is going to plant a place.

Hampel, Karl. 150 kleine Gärten. Plan, Beschreibung und Bepflanzung. Berlin: Paul Parey, 1910. 4°. MSD

German.

Plans, descriptions and planting lists for gardeners, builders and owners of suburban villas. A book full of practical suggestions for the suburban garden.

Henslow, T. Geoffrey W. Ye sundial booke. London: E. Arnold, 1914. 4°. MSF

English.

Pictures of sundials and their sources. An enchanting book.

Hubbard, Henry Vincent, and Theodora Kimball. An introduction to the study of landscape design. New York: The Macmillan Company, 1917. 4°. MSD

Mr. Hubbard is Assistant Professor of Landscape Architecture and Miss Kimball is Librarian of the School of Landscape Architecture at Harvard University.

The book deals with landscape effects, colors, composition, planting design, design of structures in relation to landscape, etc. Has a large and full bibliography.

Hutcheson, Martha Brookes Brown. The spirit of the garden, with an introduction by Ernest Peixotto. Boston: The Atlantic Monthly Press [1923]. 4°. MSF

Jekyll, Gertrude. Colour schemes for the flower garden. London: "Country Life," Ltd.; New York: Charles Scribner's Sons, 1919. 4. ed. 8°. VQG

English.

The best book on the subject.

—— Garden ornament. London: Offices of "Country Life," 1918. f°. ††MSF

English.

With photographs arranged under headings of gateways, steps, urns, vases, courts, loggias, garden houses, bridges, etc., all of English gardens. A most valuable book for every gardener.

Jekyll, Gertrude, and Lawrence Weaver. Gardens for small country houses. London: Country Life, 1914. 3. ed. 4°. †MSD

English.

By two authorities — Miss Jekyll, a landscape gardener, and Mr. Weaver, an architect. Full of ideas for the small garden, the pool, the furniture, walks, lay-out of the rock garden, etc. With plans and photographs.

Kellaway, Herbert J. How to lay out suburban home grounds. New York: John Wiley & Sons, 1907. 8°. 3-MSD

A practical treatise on the subject.

Kemp, Edward. How to lay out a garden. New York: John Wiley, 1860. 2. ed. 12°. 3-MSD

English.

One of the classic books on garden design. It sponsors naturalistic landscape gardening.

—— Landscape gardening; how to lay out a garden; edited, revised and adapted to North America, by F. A. Waugh. New York: John Wiley & Sons, 1911. 4. ed. 12°. MSD

English.

Basic principles of naturalistic garden design.

Kimball, Theodora, joint author. *See* **Hubbard,** Henry Vincent, and Theodora Kimball.

Langley, Batty. New principles of gardening; or, The Laying out and planting parterres, groves, wildernesses, labyrinths, avenues, parks, &c.... London: A. Bettesworth and J. Batley, 1728. 4°. VQD

Le Rouge, George Louis. Détails des nouveaux jardins à la mode. [Jardins anglo-chinois, etc.] Cahiers 1–22. Paris, 1776–87. 3 v. f°.

Contains plates of contemporary gardens and of Chinese pleasure palaces.

Lent by Mrs. Mortimer J. Fox.

ening as an Art, continued.

n in the Garden, continued.

Roy, Jacques, baron. Castella & prae- nobilium Brabantiæ. Lugduni Bata- m: e typographia Petri Vander Aa, f°. † **GBXB**

gian.

pper plates of castles and other large estates of m, showing the planning and planting. Inter- historically.

th, Andries de. De Vechtstroom, van cht tot Muiden. Amsteldam: H. Gart- W. Vermandel en J. W. Smit, 1790. †† **MSK**

ch.

translation of the French title says "the de- of the river La Vecht from Utrecht to Munden; collection of 100 views of tours, villages, urial homes, country scenes and chateaux along er."

Cormick, Harriet Hammond. Land- art, past and present. New York, on: Charles Scribner's Sons, 1923. f°. † **MSC**

praise of naturalistic landscape design, with es of old Persian and Egyptian, Italian and gardens. The illustrations are very instructive.

gge, Leberecht. Die Gartenkultur des ahrhunderts. Jena: E. Diederichs, 8°. **MSD**

man.

ny town and small gardens described with plans hotographs. Valuable chapter on gardens in g schemes, a subject in which Germany excels.

llet, Claude. Théâtre des plans et nages. [By Claude Mollet.] Paris, 1652.

thesius, Hermann. Landhaus und Gar- München: F. Bruckmann A. G., 1907. † **MRGF**

man.

ws modern types of country house architecture, ure and gardens. Mostly about houses.

uhaus, Eugen. The San Diego garden San Francisco: P. Elder and Co. [1916.] **MAW**

sonal impressions of the architecture, sculpture, lture, color scheme and other æsthetic aspects Panama-California International Exposition. The was Assistant Professor of Decorative Design at niversity of California in 1916. Descriptions ctures of Spanish architecture and garden art United States.

hols, Rose Standish. English pleasure ens, with eleven plans drawn by Ellen ox and nearly three hundred repro- ons of original photographs and draw- by the author. New York: The Mac- n Company, 1902. 8°. **MSK**

author traces the development of the English from the gardens of antiquity.

uveau theatre de la Grande Bretagne: escription exacte des palais du roy et naisons les plus considerables des seig- & des gentilshommes de la Grande Bretagne. Londres: D. Mortier [etc.], 1715–28. 4 v. f°.

The plates are by Kip and Knyff. Valuable as showing the old gardens of that period.
Lent by Mrs. Mortimer J. Fox.

Osborne, Charles Francis, editor. Historic houses and their gardens... Edited by C. F. Osborne... Introduction by Frank Miles Day. Philadelphia: J. C. Winston Co., 1908. 4°. † **MSD**

Palaces, castles, country places and gardens of the old and the new world described by several writers. Illustrated with plans and photographs.

Parsons, Samuel. The art of landscape architecture. New York: G. P. Putnam's Sons, 1915. 8°. **MSD**

Has bibliography of the naturalistic school. Development of landscape architecture and its application to modern landscape gardening.

—— How to plan the home grounds. New York: Doubleday & McClure Company, 1899. 12°. **3 – MSD**

Gives basic principles and general information in designing and planning.

Persian manuscript, 17th century. (Morgan ms. no. 469.)

Lent by The Pierpont Morgan Library.

Platt, Charles Adams. Monograph of the work of Charles A. Platt, with an introduction by Royal Cortissoz. New York: The Architectural Book Publishing Co. [cop. 1913.] f°. †† **MQZ**

Plans and photographs of exteriors and interiors of houses and gardens designed by one of America's greatest architects.

Powell, Edward Payson. Hedges, windbreaks, shelters and live fences. New York: Orange Judd Company, 1914. 12°. **VQS**

A treatise on the planting, growth and management of hedge plants for country and suburban homes.

Price, Sir Uvedale. Essays on the picturesque, as compared with the sublime and the beautiful; and, on the use of studying pictures, for the purpose of improving real landscape. London: Printed for J. Mawman, 1810. 3 v. 8°. **3–MSD**

Pueckler-Muskau, Hermann Ludwig Heinrich, Fürst von. Hints on landscape gardening, by Prince von Pückler-Muskau; translated by Bernhard Sickert and edited by Samuel Parsons. Boston and New York: Houghton Mifflin Company, 1917. 8°.

German. **MSD**

The author gives concrete pictures of the great English estates of his day, the early nineteenth century, and also discusses the fundamental principles of landscape gardening. The book belongs to the naturalistic school.

Rehmann, Elsa. The small place; its landscape architecture. New York and London: G. P. Putnam's Sons, 1918. 8°. **MSD**

"I have selected 15 problems in landscape architecture to show in simple and popular manner the fundamentals that underlie the planning and planting of a small place."

Gardening as an Art, continued.

Design in the Garden, continued.

Repton, Humphry. The art of landscape gardening. Including his sketches and hints on landscape gardening and theory and practice of landscape gardening. Edited by John Nolen. Boston: Houghton Mifflin Co. [1907.] 8°. MSD

English.

The author was the leading designer of naturalistic landscape gardens at the end of the eighteenth and beginning of the nineteenth centuries in England. General observations and accounts of what was done in various places.

—— Sketches and hints on landscape gardening. London: W. Bulmer & Co. [pref. 1794.] 4°. †† MSD

English.

His books have superimposed plates showing results of the improvements made.

Repton, Humphry, and J. A. Repton. Fragments on the theory and practice of landscape architecture. London: J. Taylor, 1816. f°. †† MSD

Rogers, William Snow. Garden planning. Garden City: Doubleday, Page & Company, 1911. 12°. (Garden library.) VQG

A practical book on garden planning.

Romans, Jacob. Conspectus novi praetorii Loo. [Amstelodami, 1700.] 8°. MSK

Dutch.

A collection of engravings of the palace at Loo.

Sedding, John Dando. Garden-craft, old and new. With a memorial notice by the Rev. E. F. Russell. London and New York: John Lane, 1901. 8°. MSD

English.

The author says that the more he studied old gardens the better he liked them. The chapters deal with The theory of a garden, Art in a garden, Historical and comparative sketches, The stiff garden, The landscape garden, A plea for savagery. Gives both sides of the controversy for and against formal gardening.

Shelton, Louise. Beautiful gardens in America. Revised edition, with one hundred and ninety-five new illustrations. New York: Charles Scribner's Sons, 1924. 4°.

Pictures and descriptions of beautiful gardens of the United States.

Steele, Fletcher. Design in the little garden. Boston: The Atlantic Monthly Press [cop. 1924]. 8°. (The little garden series.) MSF

"Small houses are even today laid out on schemes first evolved in New England in Colonial days." Mr. Steele believes in a formal design for a small place. Good for the beginner.

Thomas, Harry Higgott. The ideal garden. London: Cassell & Co., 1910. 8°. VQD

English.

Suggestions about gardening in Wales. Has material on fragrant leaves and flowers, etc. Many valuable ideas useful to Americans.

Underwood, Loring. The garden, and its accessories. Boston: Little, Brown, and Co. [1906.] 12°. 3-MSF

Describes sundials, fountains, pools, arbors, summer houses, and enclosures. The pictures are in good taste.

Van Rensselaer, Mariana Griswold. Art out-of-doors: hints on good taste in gardening, by Mrs. Schuyler Van Rensselaer. New York: Charles Scribner's Sons, 1893. 12°. MSD

General principles of naturalistic garden design. Gardening presented as an art. Gives Mr. Olmsted's ideas.

Véra, André. Le nouveau jardin. Paris: Émile-Paul, 1912. 4°.

French.

Theories about modern art as applied to gardens, accompanied by plans and descriptions.

Lent by Mrs. Mortimer J. Fox.

Waugh, Frank Albert. The natural style in landscape gardening. Boston: R. G. Badger [1917]. 8°. MSD

Essays on the principles and beauty of naturalistic garden design.

—— Outdoor theaters. The design, construction and use of open-air auditoriums. Boston: R. G. Badger [1917]. 8°. MRE

About theaters, auditoriums, bowls, amphitheaters and similar out-door constructions, and how to build them.

Weaver, Lawrence, joint author. *See* Jekyll, Gertrude, and Lawrence Weaver.

Wells, David A., editor. The year-book of agriculture; or, The annual of agricultural progress and discovery, for 1855 and 1856. Philadelphia: Childs & Peterson, 1856. 8°. VPA

Has a biographical notice of Andrew J. Downing and an account of his work.

Wilder, Louise Beebe. Colour in my garden. Illustrated in colour, by Anna Winegar. Garden City, N. Y.: Doubleday, Page & Company, 1918. 4°. VQG

A charming book by a noted American writer on gardens. Thoroughly worth while.

Wright, Richardson Little. Flowers for cutting and decoration. New York: E. P. Dutton & Company [cop. 1923]. 8°. VQG

He writes of roses indoors and out, cut flowers from tubers and bulbs, annuals and biennials for cutting, perennials for cutting, nursery and cutting gardens, etc.

City Gardening

ryea, Minga Pope. Gardens in and
t town; with a foreword by Richardson
ght. New York: E. P. Dutton & Com-
[cop. 1923]. 8°. **VQG**

eats of city gardens and their planning and
hing; also discusses community gardens and
garden in a tiny space.

ddes, Patrick. Cities in evolution; an
duction to the town planning move-
and to the study of civics. London:
iams and Norgate, 1915. 8°. **SER**

glish.

out city housing and planning; also discusses
west garden cities.

awson, Thomas Hayton. Civic art;
es in town planning, parks, boulevards
open spaces. London: B. T. Batsford,
f°. **† MST**

glish.

. Mawson is lecturer on landscape design at the University of Liverpool. This book shows how much beauty can be put into our cities, and should serve as an inspiration to garden clubs seeking to beautify their home towns.

Robinson, Charles Mulford. The improvement of towns and cities; or, The practical basis of civic æsthetics. New York & London: G. P. Putnam's Sons [pref. 1913]. 4. ed. 12°. **SER**

A theoretical book touching on all the phases of city beautifying, including parks, architecture, window boxes and back yard gardens.

Webster, A. D. Town planting. London: George Routledge & Sons, Limited; New York: E. P. Dutton & Co. [1910.] 12°. **VQS**

English.

The trees, shrubs, herbaceous and other plants that are best adapted for resisting smoke.

History of Gardening

cil, Alicia Margaret Tyssen-Amherst.
story of gardening in England, by the
Mrs. Evelyn Cecil (the Hon. Alicia
erst). New York: E. P. Dutton and
1910. 3. ed. 8°. **VQ**

glish.

he bibliography to 1837, arranged chronologically
alphabetically). Discusses monastic, early, Tu-
andscape, nineteenth century, and modern gar-

isp, Sir Frank. Mediaeval gardens,
ery medes' and other arrangements of
s, flowers and shrubs grown in the
lle Ages, with some account of Tudor,
abethan and Stuart gardens. Edited by
daughter, Catherine Childs Paterson.
illustrations from original sources col-
d by the author. London: John Lane
]. 2 v. 4°. **MSC**

glish.

ezallier d'Argenville, Antoine Joseph.
theory and practice of gardening:
ein is fully handled all that relates to
gardens, commonly called pleasure-
ens...with the manner of laying out
ground, cutting the terrasses, and of
ing and executing all sorts of designs,
rding to the principles of geometry...
e from the French original, printed at
s, Anno 1709. By John James of Green-
. London: Printed by Geo. James, and
by Maurice Atkins, 1712. 4°. **MSD**

uchêne, A., joint author. *See* **Fouquier,**
cel, and A. Duchêne.

arle, Alice Morse. Old time gardens
y set forth. New York: The Macmillan
pany, 1902. 8°. **MSC**

lightful chapters on colonial and other gardens,
shioned flowers and other alluring subjects.

Ernouf, Alfred Auguste, baron. L'art des jardins... 3e édition entièrement refondue, avec le concours de A. Alphand. Paris: J. Rothschild [1886]. f°. **† MSD**

French.

A history of gardening from the Roman gardens to date. Has a good deal about informal gardens. Many plates and plans, many unusual examples being shown.

Fouquier, Marcel. De l'art des jardins du xve au xxe siècle. Paris: E. Paul, 1911. f°. **†† MSK**

French.

A beautiful book on the history of gardens from the fifteenth to the twentieth century. With pictures, plans and descriptive text.

Fouquier, Marcel, and A. Duchêne. Des divers styles de jardins. Modèles de grandes et petites résidences. Sur l'art décoratif des jardins. Jardins européens et jardins orientaux. Paris: E. Paul, 1914. f°. **† MSC**

French.

About European and Oriental gardens from the earliest days to the present, telling of the many different styles. The illustrations are from old books, Persian miniatures, Chinese sources, modern photographs, etc.

Macartney, Mervyn Edmund. English houses & gardens in the 17th and 18th centuries, a series of bird's-eye views reproduced from contemporary engravings by Kip, Badeslade, Harris, and others, with descriptive notes by M. Macartney. London: B. T. Batsford, 1908. 8°. **MSK**

English.

A valuable collection of prints of old English gardens showing their design. The notes tell of the ownership and condition of the places up to 1908. The book gives the formal old gardens of England.

Gardening as an Art, continued.

History of Gardening, continued.

Mangin, Arthur. Histoire des jardins anciens et modernes. Tours: Alfred Mame et fils, 1887. 4°. **†MSC**

French.

Starting with the Garden of Eden and including the Paradise of Quatzelcoatl, the author goes down through history to his own day. Always he gives the philosophy of each period which inspired its gardens.

Matthews, William Henry. Mazes and labyrinths. London: Longmans, Green and Co., 1922. 8°. **MTE**

English.

A general account of their history and development. Has a bibliography.

Plinius Secundus. Historia naturalis. Venetiis, J. Spira, 1469. f°.

Lent by The Pierpont Morgan Library.

Riat, Georges. L'art des jardins. Paris: L. H. May ₍1900₎. 8°. (Bibliothèque de l'enseignement des beaux-arts.) **MSC**

French.

A history of gardens from those of Assyria, Persia and Egypt through to the naturalistic gardens of the nineteenth century — but not as far as the formal ones of to-day.

Roman de la Rose. Manuscript. (Morgan ms. no. 324.)

Lent by The Pierpont Morgan Library.

Sieveking, Albert Forbes. The praise of gardens: an epitome of the literature of the garden-art. With an historical epilogue. London: J. M. Dent & Co., 1899. 8°. **MSC**

English.

Quotations from authors describing gardens through all ages. A valuable work for the collector of garden books. It is composed entirely of excerpts from original sources.

Tabor, Grace. Old-fashioned gardening; a history and a reconstruction. New York: McBride, Nast & Co., 1913. 8°. **VQ**

Treats of the different types of old American gardens; full of charming suggestions for present-day gardens.

Temple, Sir William. Miscellanea. The second part. In four essays. I. Upon Ancient and Modern Learning. II. Upon the Gardens of Epicurus. III. Upon Heroick Virtue. IV. Upon Poetry. The Fourth Edition. London: Printed for Ri. Simpson... and Ra. Simpson, 1696. 12°. **NCZ**

Triggs, Harry Inigo. Garden craft in Europe. London: B. T. Batsford ₍1913₎. 4°. **MSC**

English.

A short account of the garden craft of Europe. Tells about the ancient gardeners of Europe of the Middle Ages, Italy, Le Notre and Versailles, the Netherlands, Germany, Austria, and England of the sixteenth, seventeenth and eighteenth centuries. Treats of the latter English landscape school and its influence on the continent. Has a good bibliography.

Walpole, Horace. The history of the modern taste in gardening. (In his: Anecdotes of painting in England...collected by G. Vertue and now digested and published from his original mss. by...H. Walpole. Strawberry-Hill, 1762–71. 4 v. 4°. appended to v. 4.)

Gardening in Other Lands

England

Agar, Madeline, joint author. *See* **Stout,** Mary, and Madeline Agar.

Boyle, Eleanor Vere. Days and hours in a garden. By "E. V. B." London: E. Stock, 1896. 12°. **VQE**

Bright, Henry Arthur. A year in a Lancashire garden. London: Macmillan & Co., 1891. 12°. **VQE**

Caus, Isaac de. Wilton-Garden. ₍London?₎ Are to bee sould by Thomas Rowlett, n.d. ob. 8°. **MSK**

A facsimile reprint, by Quaritch, 1895.

A second title, beginning Hortus Penbrochianus, is taken from the plate numbered 3–4.

Divers, W. H. Spring flowers at Belvoir castle. With directions for cultivation and notes on the gardens. London: Longmans, Green & Co., 1909. 8°. **QEG**

By the head gardener to the Duke of Rutland. Has special reference to spring bedding at Belvoir castle, and has notes on how to make gardens more beautiful in the early months of the year.

Elgood, George S., joint author. *See* **Jekyll,** Gertrude, and George S. Elgood.

Ellacombe, Henry Nicholson. In a Gloucestershire garden. London: E. Arnold, 1895. 12°. **VQE**

Gardens old and new: the country house & its garden environment. London: Office of Country Life ₍1902–08₎. 3 v. f°. (Country Life library.) **†MSD**

Collections of photographs of English country places, principally of the gardens and exteriors of the houses.

Holme, Charles. The gardens of England in the midland & eastern counties, edited by Charles Holme. London, Paris & New York: Offices of "The Studio," 1908. 4°. (Special winter number of 'The Studio,' 1908–09.) **†MSK**

—— The gardens of England in the northern counties; edited by Charles Holme. London: "The Studio" Ltd., 1911. f°. (International studio. Special spring number, 1911.) **†MSK**

—— The gardens of England in the southern & western counties, edited by

Gardening as an Art, continued.

Gardening in Other Lands—England, cont'd.

Charles Holme. London, New York: Offices of "The Studio," 1907. 4°. (Special winter number of 'The Studio,' 1907–08.) † MSK

Jekyll, Gertrude, and George S. Elgood. Some English gardens, after drawings by George S. Elgood, R. I., with notes by Gertrude Jekyll. London: Longmans, Green and Co., 1910. new ed. 4°. †† VQ

Also some Scottish and Irish gardens; profusely illustrated.

Maxwell, Sir Herbert Eustace, 7th bart. Scottish gardens; being a representative selection of different types, old and new. Illustrated by Mary G. W. Wilson. London: E. Arnold, 1908. 4°. † MSK

An account of the gardens in a country which has produced some of the best gardeners in the world.

Moncrieff, Ascott Robert Hope. Kew Gardens. Painted by T. M. Martin, described by A. R. H. Moncrieff. London: A. & C. Black, 1908. 8°. CO

An historical description of Kew Gardens, with a chapter on the plants and the botanical collections.

Roberts, Harry. The chronicle of a Cornish garden. London, 1900. 8°.

Robinson, William. The English flower garden. London: John Murray, 1896. 5. ed. 8°. VQG

First published in 1883.

Rodgers, Joseph. The scenery of Sherwood Forest, with an account of some eminent people once resident there. London: T. F. Unwin, 1908. 4°. CO

Historical, with a description of the trees of the forest.

Stout, Mary, and Madeline Agar. A book of gardening for the sub-tropics... A preface by Charles Whymper. London: H. F. & G. Witherby, 1921. 12°. VQD

Tinley, George F., and others. Color planning of the garden. Introduction by Miss Jekyll. London: T. C. and E. C. Jack, Ltd., 1924. 4°.

A new and very fine book.

Tipping, Henry Avray. English gardens. London: Country Life, Ltd., 1925. f°. † MSK

A series of photographs of English gardens, with descriptive text.

Ward, Cyril. Royal gardens; illustrated with thirty-two full-page colour reproductions from original water-colours and with five pen drawings by the author. London: Longmans, Green and Co., 1912. f°. † MSK

Tells about the gardens of royalty during English history. Would serve as a guide to a seeker for fine English gardens to visit.

Warwick, Frances Evelyn Maynard, countess of. An old English garden. London: A. L. Humphreys, 1898. f°. †† VQE

Waterfield, Margaret, editor. Flower grouping in English, Scotch & Irish gardens; notes & 56 sketches in colour by Margaret Waterfield. With contributions by E. V. B., S. Arnott [and others]. London: J. M. Dent & Co.; New York: E. P. Dutton & Co., 1907. 4°. † VQG

France

Archer, Dorothy. Corsica, the scented isle. London: Methuen & Co., Ltd. [1924.] 8°. DRT

A splendid book by an Englishwoman. Valuable as a guide to the flora.

Ganay, Ernest de. Chantilly au xviii^e^ siècle. Paris: G. Van Oest, 1925. 4°. † DPW

A history of Chantilly, one of the greatest French chateaux. Le Notre did over the gardens and the pictures give interesting glimpses of the period and the gardens.

Liger, L. Le jardinier fleuriste. Paris: Savoye, 1787. 12°. VQD

A small book with plant lists and descriptions, showing there were small gardens whose owners knew all about gardening at this period in France.

Marrast. Jardins. Paris: Ch. Moreau [1926]. f°.

A collection of pictures of gardens in the Paris Exposition of 1925, and of other very modern French gardens.

Lent by Mrs. Mortimer J. Fox.

Nolhac, Pierre de. Histoire du château de Versailles. Versailles sous Louis xiv. Paris: A. Marty, 1911. 2 v. f°. † MQWF

v. 2 published by Émile Paul.

A description and history of Versailles, whose gardens were designed by Le Notre, the great French landscape architect.

Pean, P. Jardins de France; 132 planches donnant de nombreux aspects des plus beaux jardins de notre pays, accompagnés de plans et de notices explicatives. Préface de M. le docteur Carvallo. Paris: A. Vincent, 1925. 2 v. f°. †† MSK

A collection of photographs and plans of the most noted French gardens.

Perrelle, Adam, and others. [Collection of copper engravings illustrating the palaces and gardens of Versailles, Fontainebleau, St. Cloud, etc., in the seventeenth century; by Perrelle, Silvestre, van Merle, Mariette, Le Blond, Poilly, Jollain, and Langlois. Paris, circa 1690.] 225 pl. mounted on 100 l. f°. †† MEM

Rigaud, Jean. Recueil de cent vingt-une des plus belles vues de palais, chateaux et maisons royales de Paris et de ses environs, dessinées d'après nature en 1780, et gravées

Gardening as an Art, continued.

Gardening in Other Lands—France cont'd.

par J. Rigaud. Paris: chez Treuttel et Würtz [1785?]. f°. †† MQWF

A collection of engravings of famous old French chateaux done before many of them were destroyed.

Stein, Henri. Les jardins de France, des origines à la fin du xviii^e^ siècle. Paris: D. A. Longuet [1913]. f°. †† MSK

A short introduction to a collection of photographs of engravings and cuts illustrating the development of French gardens from the origin to the end of the eighteenth century. The author is a curator of the National Archives. There are 104 plates and 393 reproductions of old prints — all from original documents.

Young, Arthur. Travels during the years 1787, 1788 & 1789; undertaken...with a view of ascertaining the cultivation, wealth, resources, and national prosperity of the kingdom of France. London: W. Richardson, 1794. 2. ed. 4°. DV

Has been reissued in many modern reprints.

ITALY

Carracci, Annibale. Le arti di Bologna disegnate da Annibale Caracci ed intagliate da Simone Guilini. Roma: Apresso Gregorio Roisecco, 1740. f°.

Lent by Mr. Richardson Wright.

Dami, Luigi. The Italian garden...translated by L. Scopoli. New York: Brentano's, Inc. [1924?] f°. †MSK

Reproductions of paintings representing gardens and of prints and photographs of some gardens as they are to-day. Has 351 plates.

Falda, Giovanni Battista. Li giardini di Roma. Roma: G. G. de Rossi, n.d. f°. Stuart 1694

Latham, Charles. The gardens of Italy. With descriptions by E. March Phillipps. London: Office of Country Life, Ltd., 1905. 2 v. f°. †† MSK

Many photographs, accompanied by a little text about the best known gardens.

Le Blond, Elizabeth Alice Frances Hawkins-Whitshed. The old gardens of Italy. By Mrs. Aubrey Le Blond. New York: Dodd, Mead and Company, 1926. 12°. MSK

A guide-book to the Italian gardens.

Lowell, Guy. Smaller Italian villas & farmhouses. New York: The Architectural Book Pub. Co., 1916. f°. † MQWB

"The book consists largely of photographs and sketches of little known villas. It also contains views and plans of the better known ones." It is chiefly architectural but has garden plans and pictures also. Author, who recently died, was a well-known architect.

Montagu, Lady Mary Wortley. Letters from the Right Honourable Lady Mary Wortley Montagu, 1709 to 1762. London: J. M. Dent & Co. [1906.] 16°. NDD

Her letters to her daughter, the Countess of Bute, dated July 10 and 26, 1748, and Oct. 17 and 25, 1750, describing her garden in Italy, are printed on p. 363-367, 390-392.

Platt, Charles Adams. Italian gardens. New York: Harper & Brothers, 1894. 4°. MSK

Nineteen Italian villas described and illustrated with photographs. The author is a prominent architect.

Sitwell, Sir George Reresby. An essay on the making of gardens; being a study of old Italian gardens, of the nature of beauty, and the principles involved in garden design. London: John Murray, 1909. 8°.

A charming small book on Italian gardens. MSK

Triggs, Harry Inigo. The art of garden design in Italy. Illustrated by seventy-three photographic plates reproduced in collotype, twenty-seven plans and...sketches in the text...and twenty-eight plates from photographs by Mrs. Aubrey Le Blond. London: Longmans, Green & Co., 1906. f°. †† MSK

Has an historical introduction and pictures of thirty-two Italian villas of note, accompanied by descriptive text.

Wharton, Edith. Italian villas and their gardens; illustrated with pictures by Maxfield Parrish and by photographs. New York: Century Co., 1910. 4°. MSK

A gift book written and illustrated by two great artists.

SPAIN

Byne, Mildred Stapley, and ARTHUR BYNE. Spanish gardens and patios, illustrated with 175 examples, 4 plates in colour. Philadelphia & London: J. B. Lippincott Company; New York: The Architectural Record, 1924. 4°. MSK

The book tells of the old and new gardens of the south of Spain, Andalusia, and the island of Majorca.

Nichols, Rose Standish. Spanish & Portuguese gardens. Boston and New York: Houghton Mifflin Company, 1924. 8°. MSK

Shows the development of Spanish gardens from Persian sources.

Rusiñol, Santiago. Jardines de España. [Barcelona: A. López, 1914.] f°. † MSK

Consists of poems and articles about the artist Rusiñol, accompanied by reproductions of his paintings of Spanish gardens.

MOROCCO

Gallotti, Jean. Moorish houses and gardens of Morocco. New York: William Helburn, Inc. [1925.] 2 v. 4°. MQWW

French text.

A most interesting book on a little known subject.

MADEIRA

Du Cane, Florence. The flowers and gardens of Madeira, painted by Ella Du Cane,

Gardening as an Art, continued.

Gardening in Other Lands—Madeira, cont'd.

described by Florence Du Cane. London: A. and C. Black, 1909. 8°. **VQG**

An attractive representation of the gardening of Madeira. Colored illustrations.

JAPAN

Conder, Josiah. The flowers of Japan and the art of floral arrangement. Tokio: Hakubunsha, Ginza; London: Sampson Low, Marston & Company, Limited, 1892. f°. **†† 3MAG**

The author was Professor of Architecture and architect to the Imperial Japanese Government and is the authority on Japanese gardens. Treats of the meaning, philosophy and folklore back of the flower arrangement, position of flowers in the room, and arrangement for different occasions; also gives practical examples of arrangement. Pictures of receptacles and arrangements in black and white and in color, done by Japanese artists.

—— Landscape gardening in Japan. Yokohama: Kelly and Walsh, Limited, 1893. f°. **† MSK**

The best and most complete book on Japanese gardening, with descriptive and structural information. Chapters on history, garden stones, lanterns, pagodas, water basins, walls, wells, bridges, arbors, etc.

—— —— Supplement. With collotypes by K. Ogawa. Tokio: Kelly & Walsh, Limited, 1893. f°. **† MSK**

A collection of photographs of the gardens.

Piggott, Francis Taylor. The garden of Japan; a year's diary of its flowers. London: George Allen, 1892. 4°. **QFH**

A most beautiful and sympathetic book.

Taylor, Harriet Osgood. Japanese gardens. By Mrs. Basil Taylor. With...pictures in colour by Walter Tyndale. London: Methuen & Co., Ltd. [1912.] 4°. **MSK**

The author seeks to recall to the traveller and to give to the reader the charm of Japanese gardens. Has chapters on Japanese garden history, flower arrangement, fences and hedges, stones, and many other interesting subjects.

Usui, Kosaburo, compiler. Historical gardens in Kyoto. [Kyoto: N. Yamada, 1910.] 2 v. 4°. **MSK**

Title-pages in Japanese; text in Japanese and English.

Volume 2 contains a collection of photographs of Japanese gardens with Japanese and English descriptions and notes.

CHINA

Chambers, Sir William. Designs of Chinese buildings, furniture, dresses, machines, and utensils, engraved by the best hands from the originals drawn in China... To which is annexed a description of their temples, houses, gardens, etc. London, 1757. f°.

The best book on Chinese gardens.

Goldsmith, Oliver. The citizen of the world; or Letters from a Chinese philosopher, residing in London, to his friends in the East. London: Printed for the author, and sold by J. Newbery, 1762. 2 v. 12°.

Includes an account of a Chinese garden. *** KL**

Kerby, Kate. *See* **Wèn Cheng-ming.**

Wèn Cheng-ming. An old Chinese garden; a three-fold masterpiece of poetry, calligraphy and painting, by Wen Chên Ming. Studies written by Kate Kerby; translations by Mo Zung Chung. Shanghai, China: Chung Hwa Book Co. [1923.] f°. **† MAG**

Reproduction of the scroll masterpieces of the foremost landscape artist of the Ming dynasty, together with translations of his complementary poems.

INDIA

Stuart, C. M. Villiers. Gardens of the great Mughals. London: A. and C. Black, 1913. 8°. **MS**

Tells of an art perfect of its kind and full of inspiration for our southern gardens.

SOUTH AFRICA

Cran, Marion Dudley. The gardens of Good Hope. London: Herbert Jenkins, 1926. 8°.

On the gardens of South Africa.

BIOGRAPHIES

Banks, Sir Joseph, bart. Journal of the Rt. Hon. Sir Joseph Banks, bart...during Captain Cook's first voyage in H.M.S. Endeavour in 1768–71... Edited by Sir Joseph D. Hooker. London: Macmillan & Co., Ltd., 1896. 8°. *** R – KBF**

Bazalgette, Léon. Henry Thoreau, bachelor of nature. Translated by Van Wyck Brooks. New York: Harcourt, Brace and Company [cop. 1924]. 8°. **AN**

Caddy, Florence. Through the fields with Linnæus; a chapter in Swedish history. London: Longmans, Green, and Co., 1887. 2 v. 12°. **AN**

Darlington, William. Memorials of John Bartram and Humphry Marshall. Philadelphia: Lindsay & Blakiston, 1849. 8°. **AN**

Darwin, Charles. The life and letters of Charles Darwin, including an autobiographical chapter, edited by Francis Darwin. London: John Murray, 1887. 3 v. 8°.

Eliot, Charles William. Charles Eliot, landscape architect. [By C. W. Eliot.] Bos-

Biographies, continued.

ton: Houghton, Mifflin & Co., 1902. 8°. **MSC**

A biography of one of America's landscape architects, telling of his studies and his practice of the profession.

Farnham, Charles Haight. A life of Francis Parkman. Boston: Little, Brown and Company, 1905. 8°. ***R–AN**

Harshberger, John William. The botanists of Philadelphia and their work. Philadelphia: [T. C. Davis & Sons,] 1899. 8°. **AB**

Hill, Arthur W. Henry Nicholson Ellacombe, a memoir. London: Country Life, 1919. 8°.

Ivins, Lester Sylvan, and A. E. Winship. Fifty famous farmers. New York: The Macmillan Company, 1924. 8°. **AB**

Kelly, Howard Atwood. Some American medical botanists commemorated in our botanical nomenclature. Troy, N. Y.: Southworth Co., 1914. 8°. **AB**

Mitchell, Broadus. Frederick Law Olmsted, a critic of the old South. Baltimore: The Johns Hopkins Press, 1924. 8°. (John
Hopkins University studies in historical and political science. series 42, no. 2.) **SB**

Muir, John. The life and letters of John Muir, by William Frederic Badè. Boston: Houghton Mifflin Company, 1924. 2 v. 8°. **PSK**

North, Marianne. Recollections of a happy life; being the autobiography of Marianne North. Edited by her sister, Mrs. John Addington Symonds. London: Macmillan and Co., 1892. 2 v. 8°. **AN**

An account of Miss North's travels all over the world to paint pictures of flowers. They are now at Kew.

Oliver, F. W. Makers of British botany; a collection of biographies by living botanists. Cambridge: University Press, 1913. 8°. **QEB**

Ward, Francis Kingdon. The romance of plant hunting. London: E. Arnold & Co., 1924. 8°. **QFH**

Winship, A. E., joint author. *See* **Ivins,** Lester Sylvan, and A. E. Winship.

PICTURES

Mediaeval Gardens

Persian manuscript showing a garden scene.

A Garden scene from a manuscript of Khwājū Kirmānī dated A.D. 1396 Baghdad. Timurid School. (From "Miniature painting of Persia, India and Turkey," by Martin.)

Virgin at the fountain 1439. (From "Mediaeval gardens," by Sir Frank Crisp.)

Railed and "chessboard" garden of A.D. 1470. (From "Mediaeval gardens," by Sir Frank Crisp.)

A Garden scene from a manuscript by Khwājū Kirmānī dated A.D. 1396 Baghdad. Timurid School. (From "Miniature painting of Persia, India and Turkey," by Martin.)

Indian miniatures showing garden scenes.

French garden of 1526. From a manuscript in the Arsenal Library at Paris.

Castle garden, from the Procession of the Magi, 1452. (From "Mediaeval gardens," by Sir Frank Crisp.)

Mosaic garden of A.D. 1620. (From "Mediaeval gardens," by Sir Frank Crisp.)

In Fra Angelico's fresco (about 1440) of the annunciation, is quite a "flowery mede" from its profusion of flowers in the grass. (From "Mediaeval gardens," by Sir Frank Crisp.)

The Call to prayer at night — illustration from the Timūrnāma; painted by Madhu the Elder and Tulsi the Elder A.D. 1585 — Oriental Public Library, Bankipur. (From "Indian painting under the Murghals," by Percy Brown.)

Typical mediaeval garden of pleasaunce. (From "Mediaeval gardens," by Sir Frank Crisp.)

Tent in a "Flowery mede" (from a tapestry of the 15th century "The Lady and the unicorn," Flemish or French school, Cluny Museum, Paris). (From "Mediaeval gardens," by Sir Frank Crisp.)

A Lover and his lady — a miniature from a manuscript of Khwājū Kirmānī dated A.D. 1396. Baghdad. (From "Miniature painting of Persia, India and Turkey," by Martin.)

Modern garden of Gethsemane. (From "Mediaeval gardens," by Sir Frank Crisp.)

The Garden of Gethsemane is seen again with high brick beds and plants (in the Academy, Florence). (From "Mediaeval gardens," by Sir Frank Crisp.)

Dorica. (From "Des Divers styles de jardins," par M. Fouquier et A. Duchêne.)

Corinthia. (From "Des Divers styles de jardins," par M. Fouquier et A. Duchêne.)

Garden of A.D. 1601, comparing in some respects with those of Crispin de Pass of later date, the arbours or galleries being quite

Pictures, continued.

Mediaeval Gardens, continued.

in his style. The four separate enclosed gardens with their formal beds survived more than 50 years. (From "Mediaeval gardens," by Sir Frank Crisp.)

PAINTING of a jonquil from Dara Shikoh's album, India Office Library, London.

WILD FLOWERS

PLATES from "North American wild flowers," done by Mrs. Walcott.

Lent by Mr. W. E. Rudge.

Golden star, White thistle, Bog kalmia, Trumpet leaf, Pineland aster, Balsamroot, Red lily, Virginia spiderwort, Canada lily, Sun-dial lupine.

TRELLISES AND ARCHWAYS

To the kitchen garden, Hutton in the Forest, England. (From "Gardens old and new," volume 3, 1908.)

YEW walk at Melbourne Hall, Derbyshire, England. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

A FEATURE of the garden — garden of the Quirinal, Rome, Italy. (From "Gardens of Italy," by Charles Latham.)

A VINE pergola of slight poles in Mrs. F. Eden's garden in Venice. (From "Garden ornament," by Gertrude Jekyll.)

A PLEACHED alley of old fruit trees at Drayton House, Northamptonshire. (From "Garden ornament," by Gertrude Jekyll.)

L'EVÊCHÉ at Meaux, France. (From "Les Jardins de France des origines à la fin du XVIIIième siècle," par Henri Stein.)

COVERED avenue, Boboli, Florence, Italy. (From "The Italian garden," by Luigi Dami.)

GARDEN ACCESSORIES AND FURNITURE

MOVABLE garden seat of modern pattern (from a tapestry of the 15th century "The Lady and the unicorn," Flemish or French School, Cluny Museum, Paris). (From "Mediaeval gardens," by Sir Frank Crisp.)

TERRACES AND BALUSTRADES

The UPPER fountain on the summit, an architectural triumph, Villa Torlonia, Italy. (From "Gardens of Italy," by Charles Latham.)

CYPRESS avenue, Villa d'Este, Cernobbio, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

The CENTRAL walk, Villa d'Este, Tivoli, Italy. (From "Gardens of Italy," by Charles Latham.)

LOGGIA from upper terrace, Villa d'Este, Tivoli, Italy. (From "Gardens of Italy," by Charles Latham.)

LOOKING northward from the first terrace, the city of Corfu in the distance. The Achilleon. (From "Historic houses and their gardens," by Charles F. Osborne.)

The GARDEN from the Villa, Villa Medici, Rome, Italy. (From "Gardens of Italy," by Charles Latham.)

The TERRACE of the "Cariatides," Caprarola, Italy. (From "The Italian garden," by Luigi Dami.)

The EAST porch and St. Peter's, the Vatican, Rome, Italy. (From "Gardens of Italy," by Charles Latham.)

The VATICAN garden, courtyard of the Villa Pia. (From "Art of garden design in Italy," by Inigo Triggs.)

BALUSTRADE and seats, Villa Lante, near Viterbo, Italy. (From "Garden ornament," by Gertrude Jekyll.)

STEPS AND STAIRWAYS

ST. CATHERINE'S Court. One of the many beautiful scenes in this lovely garden. (From "Garden ornament," by Gertrude Jekyll.)

VIEW towards casino from the lower entrance, Villa d'Este, Tivoli, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

TERRACE and steps at Clumber Park, Nottinghamshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

The WESTERN stairway, Villa Pamphili Doria, Rome, Italy. (From "Gardens of Italy," by Charles Latham.)

JARDIN Senorial, Mallorca, Spain.

STAIRWAYS leading to the Bosco, Villa Torlonia, Frascati, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

STEPS and north front at Castle Ashby, Northamptonshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

The FOUNTAIN of the "Girandola," Villa d'Este, Tivoli, Italy. (From "The Italian garden," by Luigi Dami.)

CEDARS at steps at Canons Ashby, Northamptonshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

PRINTS LENT BY THE PIERPONT MORGAN LIBRARY

MARGINS from an old book.

COLOR plates from an old book, Henres de Henesy.

Pictures, continued.

Flowers for Decoration

May.

Lent by Mr. E. Weyhe.

Cactus in a window in Germany.

The Main Walk Garden

Herbaceous border at Sudbrooke Holme, Lincolnshire, England. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

Gardens of the Alcazar, Seville, Spain. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

Cawdor Castle. (From "Scottish gardens," by Sir Herbert Maxwell.)

Les Cours d'entrée, Balleroy, France. (From "Jardins de France," par P. Pean.)

Carnock. (From "Scottish gardens," by Sir Herbert Maxwell.)

Grass walk at Helmingham Hall, Suffolk, England. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

The March of the Persian Garden

Garden of the Conde de Güell, by S. Rusiñol. (From "Spanish and Portuguese gardens," by Rose Standish Nichols.)

Jardin de Monforte, painted by S. Rusiñol. (From "Spanish and Portuguese gardens," by Rose Standish Nichols.)

Green or Masonry Walls

The Spring garden, sheltered by thick cypress hedges, Villa Palmieri, Florence, Italy. (From "Historic houses and their gardens," by Charles F. Osborne.)

Semi-Circular court of the Cascade, Villa Aldobrandini, Rome, Italy. (From "Gardens of Italy," by Charles Latham.)

Brick dry walling, planted with pansies, snapdragons, London pride and other saxifrages, with tufted pansies at the foot, Levens Hall, England. (From "Gardens for small country houses," by Gertrude Jekyll.)

The Pond garden, Hampton Court Palace, England. (From "Formal gardens in England and Scotland," by Inigo Triggs, v. 2.)

The Circle of the cypresses, Villa Albani, Italy. (From "Gardens of Italy," by Charles Latham.)

Old garden in Holland. (From "De Vechtstroom, van Utrecht tot Muiden," by Andries de Leth.)

The Summer house, Vicobella, near Siena, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

Walled garden at Wrest Park, Bedfordshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

Flower and Water Parterres

Parterre of the Tiber seen from the Chateau of Fontainebleau near Paris, France. (From "Jardins de France," par P. Pean.)

Orangery at Versailles. (From "Recueil de cent vingt-une des plus belles vues de palais, chateaux et maisons royales," par J. Rigaud.)

The Garden, Gamberaia, Florence, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

Chess-board beds of garden at Trinity College, Cambridge, England, 1688. (From "Mediaeval gardens," by Sir Frank Crisp.)

The East garden and terrace at Newstead Abbey, Nottinghamshire, England. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

The Parterre La Favorita, Palermo, Italy. (From "The Art of garden design in Italy," by Inigo Triggs.)

Chateau of Bagnolet, France, the gardens from the edge of the pool. (From "Recueil de cent vingt-une des plus belles vues de palais, châteaux et maisons royales de Paris et ses environs," par J. Rigaud.)

Middelhoek, near the Vecht, Holland. (From "De Vechtstroom, van Utrecht tot Muiden," by Andries de Leth.)

Patios

Patio de la Acequia, Generalife, Granada, Spain. (From "Spanish and Portuguese gardens," by Rose Standish Nichols.)

The Fountain court, Djenan-el-Mufti, Algiers. (From "Garden ornament," by Gertrude Jekyll.)

Central canal of principal enclosure, Generalife Gardens, Granada, Spain. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

Garden of the University, Seville, Spain. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

Patio de la Sultana, Generalife, Granada, Spain. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

Inner garden of the House of Aulus Vettius, excavated at Pompeii. (From "Mediaeval gardens," by Sir Frank Crisp.)

Patio at the tartuja, Valldemosa, Spain. (From "Spanish and Portuguese gardens," by Rose Standish Nichols.)

Pictures, continued.

Patios, continued.

100 Cheyne Walk, Chelsea, London, England. (From "Gardens for small country houses," by Gertrude Jekyll.)

Patio, Museo Provincial, painted by A. Grosso. (From "Spanish and Portuguese gardens," by Rose Standish Nichols.)

Gardens of the Alcazar, Seville, Spain. A cypress arch emphasizing the main walk. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

English Gardens

A View of the Royal Palace at Hampton Court.

A View of St. James Park, London, England.

French Gardens

Garden of Henri iv of France, 1608. (From "Mediaeval gardens," by Sir Frank Crisp.)

Luxembourg Palace at Paris. The building is now the home of the French Senate and the grounds a public park.
Lent by Mrs. Monson Morris.

American Gardens and Other Gardens

The Grand Allée des Champs Elysées opposite the Tuileries in Paris.
Lent by Mrs. Monson Morris.

Tulip garden of Walter Douglas, Esq., Chauncey, New York.

Australian garden.

Garden of the late Augustus St. Gaudens, Cornish, New Hampshire.

Plan of the Park of Versailles. (From "Jardins de France," par P. Pean.)

Garden of Charles A. Platt, Cornish, New Hampshire.

Tulip garden of Walter Douglas, Esq., Chauncey, New York.

Trolleholm, Scania, Sweden.

Country home of Roy Carruthers, Columbia River Highway, Bridal Veil, Oregon.

Chinese Gardens

Courtyard of the monastery of Celestial Peace.

Fa Te or Flowery Lands.
Courtesy of Canton Christian College.

Wen Chen Ming. An old Chinese garden, a three-fold masterpiece of poetry, calligraphy and painting. Shanghai.
By the leading landscape architect of the Ming dynasty.

One of the fine old gardens at Canton.
Courtesy of Canton Christian College.

Californian and Other Modern Gardens

Residence, Harold S. Chase. Reginald D. Johnson, architect.

Residence, Mr. Jacques Vinmont. Roland E. Coate, architect.

Garden in the home of Mr. George Washington Smith.

Grace Nicholson's Treasure house. Residence. Marston, Van Pelt and Maybury.

"El Hogar." Residence of Mrs. Craig Heberton.

Residence, Harold S. Chase. Reginald D. Johnson, architect.

Residence, Mr. I. Eisner. Gordon B. Kaufman, architect.

American Gardens

"Thornewood," Tacoma, Washington. Residence of Mr. and Mrs. Chester Thorne.

"Las Tejas," Montecito, California. Residence of Mr. and Mrs. Oakleigh Thorne.

"Arcady," Montecito, California. Residence of Mr. George Owen Knapp.

Residence of Mrs. James L. Breese, Southampton, Long Island.
Photograph taken by Mattie Edwards Hewitt.

"Welwyn," Glen Cove, Long Island. Residence of Mr. and Mrs. Harold Irving Pratt.
Photographs taken by Mattie Edwards Hewitt.

Residence of Mr. and Mrs. H. H. Rogers, Southampton, Long Island.
Photographs taken by Mattie Edwards Hewitt.

Residence of Mr. George Washington Smith, Santa Barbara, California.

"El Mirador," Santa Barbara, California. Residence of Mrs. J. J. Mitchell of Chicago, Illinois.

"El Hogar," Cactus garden. Residence of Mrs. Craig Heberton.

Residence of Mrs. Henry W. de Forest, Cold Spring Harbor, Long Island, N. Y.
Photographs taken by Mattie Edwards Hewitt.

Residence of Mrs. E. T. Stotesbury, Palm Beach, Florida.
Photograph taken by Mattie Edwards Hewitt.

Mrs. Coolidge rose, exhibited at Monticello, Va.

"Blairsden," Peapack, New Jersey. Residence of Mr. and Mrs. C. Ledyard Blair.

Residence of Mrs. Thomas Emery, Newport, Rhode Island.
Photograph taken by Mattie Edwards Hewitt.

Residence of Mrs. Robert Bacon, Westbury, Long Island.
Photographs taken by Mattie Edwards Hewitt.

Pictures, continued.

American Gardens, continued.

Residence of Mr. and Mrs. Robert Brewster, Mt. Kisco, New York.
Photograph taken by Mattie Edwards Hewitt.

Residence of Mrs. A. Cobb, Santa Barbara, California.

Work of Mr. George Washington Smith, Santa Barbara, California.

Residence of Augustus St. Gaudens, Cornish, New Hampshire.
Photograph taken by Mattie Edwards Hewitt.

Residence of Mr. Charles A. Platt, Cornish, New Hampshire.
Photograph taken by Mattie Edwards Hewitt.

Residence of Mr. Maxfield Parrish, Cornish, New Hampshire.
Photograph taken by Mattie Edwards Hewitt.

"Pompey's Garden," Pride's Crossing, Massachusetts. Residence of Mrs. Quincy Adams Shaw.

Magnolia garden, Charleston, South Carolina. Residence of Mr. and Mrs. C. Norwood Hastie.

"Willowmere," Roslyn, Long Island, N. Y. Residence of Mrs. Aaron Ward.

The Garden of Thomas Jefferson at Monticello, from an old print.

Monticello, the home of Thomas Jefferson, planned by himself.

The Garden at Mount Vernon.

Martha Washington's garden at Mount Vernon.

Wild Flowers Which Need Protection

Wild flowers in danger of extinction. Plates by Mary E. Eaton.

Bird's-foot violet (Viola pedata L.). Bloodroot (Sanguinaria canadensis L.). Wild azalea (Azalea nudiflora L.). Wild columbine (Aquilegia canadensis L.). Flowering dogwood (Cynoxylon floridum). Jack in the pulpit (Arisaema triphyllum (L.) Torr.). Liverleaf (Hepatica hepatica (L.) Karst). Fringed gentian (Gentiana crinita Froel). Wild pink (Silena caroliniana Walt.).

Lent by The New York Botanical Garden.

Japanese Gardens

Ike-no-Niwa, Imperial Palace, Kioto. (From "Supplement to Landscape gardening in Japan," by Conder.)

Merchant's villa gardens of Fukagawa. (From "Supplement to Landscape gardening in Japan," by Conder.)

The Garden of the Sanbo in Temple, Japan. (From "Historic gardens in Kyoto," by Usui.)

The Stone lantern belonging to Lord Hosokawa in the Koto in Temple, Japan. (From "Historic gardens in Kyoto," by Usui.)

The Tea ceremonial room in the garden of the Sanbo in Temple, Japan. (From "Historic gardens in Kyoto," by Usui.)

Satake no Niwa, Honjo, Japan. (From "Supplement to Landscape gardening in Japan," by Conder.)

Public garden of Shuzenji, Kumanoto, and public garden of Sanno, Tokio. (From "Supplement to Landscape gardening in Japan," by Conder.)

Garden of the Reito in Temple, Japan. (From "Historic gardens in Kyoto," by Usui.)

Inspirational Books and Gardens

Garden of Mademoiselle Colombe at Ste Brice, France, now the home of Edith Wharton. Copy of a painting by Hubert Robert (1733–1808).

Portrait of Shāh Tahmāsp, as a youth, about A.D. 1540. School of Sultān Muhammad.

The Beauty of Architecture in the Garden

Old gateway at Melbourne Hall, Derbyshire, England. (From "Historic houses and their gardens," by Charles F. Osborne.)

The Cloister garden, Certosa di Pavia, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

Entrance gates, the Boboli garden, Florence, Italy. Grand alley. (From "Art of garden design in Italy," by Inigo Triggs.)

L'Embarcadère of the summer home of the French President at Rambouillet, France. (From "Jardins de France," par P. Pean.)

Entrance to the upper garden, Isola Bella, Lago Maggiore, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

Frascati, Villa Falconieri: a gate of the xvith century. (From "The Italian garden," by Luigi Dami.)

La Colonnade — Versailles, France. (From "Jardins de France," par P. Pean.)

Pools and Fountains

The Long canal, Westbury Court, Gloucestershire. (From "Formal gardens in England and Scotland," by Inigo Triggs, v. 2.)

The Cascade of the Fountain of the Organ, Villa d'Este, Tivoli, Italy. (From "Gardens of Italy," by Charles Latham.)

Pictures, continued.

Pools and Fountains, continued.

A FOUNTAIN near the Casino, Villa Giusti, Verona, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

CASCADE of the Fountain of the Organ, Villa d'Este, Tivoli, Italy. (From "Gardens of Italy," by Charles Latham.)

The GREAT balustraded fountain pool at the Villa Conti, Frascati, Italy. (From "Garden ornament," by Gertrude Jekyll.)

FONTAINE de L'Été: Céres, Versailles, France. (From "Jardins de France," par P. Pean.)

The DRAGON Fountain, Villa Mondragone, Frascati, Italy. (From "Gardens of Italy," by Charles Latham.)

The POOLS looking towards the Water Organ, Villa d'Este, Tivoli, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

The LOWER fountain, Villa della Petraia, Florence, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

The FOUNTAIN of Pegasus, Villa Lante, Bagnaia, Italy. (From "The Italian garden," by Luigi Dami.)

The FOUNTAIN in the Wood, Villa Lante, Bagnaia, Italy. (From "The Italian garden," by Luigi Dami.)

An ARAB puzzle fountain and birds' drinking place of the Campagne Mahieddin, Algiers. (From "Garden ornament," by Gertrude Jekyll.)

The FOUNTAIN of the Dragons at the Villa d'Este, Tivoli. (From "Garden ornament," by Gertrude Jekyll.)

The LILY pond at Hemingford Grey, Huntingdonshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

HOME of Monsieur Boendermaker on the Vecht. (From "De Vechtstroom van Utrecht tot Muiden," by Andries de Leth.)

Les VINGT-QUATRE jets at St. Cloud near Paris, France. (From "Jardins de France," par P. Pean.)

LOOKING up the three garden levels towards the villa, Casa del Rey Moro, Ronda, Spain. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

The TAJ, India. (From "Historic houses and their gardens," by Charles F. Osborne.)

DIPPING pool of St. Tivisian at Landivisian, Brittany, France. (From "Garden ornament," by Gertrude Jekyll.)

The ALHAMBRA, Granada. Marble fountain consisting of a Moorish tazza supported on a Renaissance pedestal. (From "Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

The CASCADE, Villa Torlonia, Frascati, Italy. (From "Art of garden design in Italy," by Inigo Triggs.)

IRIS, DAHLIAS, AND GLADIOLI

The IRIS garden at Horikiri, Japan. (From "Historic houses and their gardens," by Charles F. Osborne.)

ROSES

Two small gardens of roses, figures from the Flemish "Romance of the Rose."

SUMMER HOUSES AND GARDEN FURNITURE

A GARDEN shelter of simple and charming classical design at Petwood, Woodhall Spa. By Mr. Harold Peto. (From "Garden ornament," by Gertrude Jekyll.)

SUNDIAL, Normanton Park, Rutland. (From "Garden ornament," by Gertrude Jekyll.)

The ORANGERY, Longleat, Wilts; end of 17th or early 18th century. (From "Garden ornament," by Gertrude Jekyll.)

JARDIN at Ronda, Spain. J. C. N. Forestier.

MODERN German gardens.

A NOBLEMAN'S garden in Teheran. (From "Historic houses and their gardens," by Charles F. Osborne.)

OLD French garden plans. Designs of Le Nôtre. (From "Les Jardins de France des origines à la fin du XVIIIième siècle," par Henri Stein.)

NEW GARDENS SHOWING THE INFLUENCE OF MODERN ART ON OUT-DOOR PLANNING

FOUNTAIN at the Paris Exposition of 1925. J. J. Martel and Burkhalter.

PARTERRE of water, the Dutch Pavilion, by Staal, Paris Exposition of 1925.

GARDEN of water and light, by Guévrékian, Paris Exposition of 1925.

GARDEN in the outskirts of Paris, by Pierre Legrain.

MIRROR of water, Swedish Pavilion, Paris exposition of 1925.

GARDEN of the Sèvres Manufacture, by H. Rapin, Paris Exposition of 1925.

GARDEN at St. Germain-en-Laye, by A. and P. Véra.

GRASS plots, by H. Ploquin, Paris Exposition of 1925.

Pictures, continued.

New Gardens Showing the Influence of Modern Art on Out-Door Planning, continued.

Garden of the birds, by A. Laprade, Paris Exposition of 1925.

Walls of plants and cement trees, by Mallet-Stevens, Paris Exposition of 1925.

Garden at St. Germain-en-Laye, by A. and P. Véra.

Children's Gardens

Avenue A Children's Gardens, 64th to 67th Streets and Avenue A. Land provided by the Rockefeller Institute, maintained by the New York Plant, Flower, and Fruit Guild.

Wild Flowers

Plates from "North American wild flowers," by Mrs. Walcott.

Lent by Mr. W. E. Rudge.

Painted trillium. Avalanche buttercup. Southern coast violet. Skunk cabbage. Crowpoison. Naiad spring beauty. Tar flower. Crested iris. Squirrelcorn. Glacier lily. Carolina maple. Pussy willow. Rhodora. Saskatoon. Sweet vetch. Highbush blackberry. Canada buffalo berry. Creeping holly. Red maple. Lodge pole pine.

Twenty plates from "Addisonia."

Trees

Cypresses Dorados, Granada, Spain. (From "The Spanish gardens and patios," by Mildred Stapley Byne and Arthur Byne.)

Ancient boxwood, Montpelier, Virginia. Residence of Mr. William du Pont.

The Gardens and castles of Miramar near Trieste, Austria. (From "Historic houses and their gardens," by Charles F. Osborne.)

Formal garden at Compton Wynyates, Warwickshire. (From "Gardens of England in the midland and eastern counties," by Charles Holme.)

The East side of the garden, Bradfield, England. (From "Gardens old and new," v. 3.)

Sudeley Castle, Gloucestershire, England. (From "Garden ornament," by Gertrude Jekyll.)

Magnolia garden, Charleston, South Carolina.

The Allée of chestnut trees at Versailles, France. (From "Recueil de cent vingt-une des plus belles vues de palais, chateaux et maisons royales de Paris et de ses environs," par J. Rigaud.)

Arquitectura Verde, Granada, Spain.

Clipped yew hedges at Holme Lacy, Herefordshire, England. (From "Garden ornament," by Gertrude Jekyll.)

Yew hedges at Wickham Court, Kent, England. (From "Garden ornament," by Gertrude Jekyll.)

Bridge end gardens, Saffron Walden, England. (From "Formal gardens in England and Scotland," by Inigo Triggs.)

L'Avenue at Cordes, France. (From "Jardins de France," par P. Pean.)

Levens Hall, England. The house from the gardens. (From "Historic houses and their gardens," by Charles F. Osborne.)

Mirrored cypresses, Villa Falconieri, Frascati, Italy. (From "Gardens of Italy," by Charles Latham.)

Passaig mistic at Montserrat, Spain.

Indian painting of a plane tree, A.D. 1610. Johnson Collection, India Office Library, London.

(Conclusion)

STARCHES

1811–1925

A LIST OF REFERENCES DEALING WITH THE CHEMISTRY AND TECHNOLOGY OF STARCHES, DEXTRINS AND AMYLASES

COMPILED BY

ROBERT P. WALTON, Science and Technology Division

Order of Arrangement

- STARCHES AND DEXTRINS
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    - Enzymic Hydrolysis
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  - Sources and Occurrence
  - Industrial Applications

PART IV

STARCHES AND DEXTRINS, *continued*

ETHERS AND ESTERS

1044. Braconnot, H. De la transformation de plusieurs substances vegétales en un principe nouveau. (Annales de chimie et de physique, Paris, 1833, série 2, tome 52, p. 290–294.) **PAA**

Starch is treated with concentrated HNO_3 and the resulting substance, termed xyloidine, examined in detail. When textiles are successively impregnated with this material and dried, they retain their stiffness and impermeability even after treatment with boiling water.

1045. Blondeau, Ch. De l'amidon et de quelques uns des composés auxquels il peut donner naissance. (Revue scientifique et industrielle, Paris, 1843, tome 15, p. 69–82.) **OA**

From a study of the action of concentrated H_2SO_4 on starch concludes that there are two starch sulphonic acids formed. Prepares and analyzes the lead salts.

Reprinted in *Jour. prakt. Chem.*, 1844, Bd. 33, p. 439–452.

Abstract in *Rapport annuel sur les progrès de la chimie*, Berzelius, 1846, année 6, p. 318–320; *Annalen der Chemie und Pharmacie*, Liebig's, 1844, Bd. 52, p. 416–417.

1046. Ballot, Buis. Xyloïdine. (Abstract.) (Rapport annuel sur les progrès de la

Starches and Dextrins, continued.

Ethers and Esters, continued.

chimie, Berzelius, Paris, 1844, année 4, p. 222–223.) **PKA**

Details preparation and constitution of xyloïdin.

1047. Fehling, H. Die Verbindungen des Stärkemehls mit Schwefelsäure. (Annalen der Chemie und Pharmacie, Liebig's, Heidelberg, 1845, Bd. 55, p. 13–26.) **PKA**

Prepares salts of starch-sulphuric acids. A large number of analytical results are given.

Condensed in *Rapport annuel sur les progrès de la chimie,* Berzelius, 1847, année 7, p. 342–345.

1048. Kalinowsky, J. von. Ueber die Einwirkung der concentrirten Schwefelsäure auf das Stärkemehl. (Journal für praktische Chemie, Leipzig, 1845, Bd. 35, p. 193–201.) **PKA**

Prepares and analyzes the calcium salt of the starch-sulphuric acid obtained.

1049. Pelouze, J. Note sur la xyloïdine. (Académie des sciences, Comptes rendus, Paris, 1846, tome 23, p. 809–811.) ***EO**

1050. —— Expériences et observations relatives à l'action de l'acide azotique monohydraté, sur l'amidon et sur les matières ligneuses. (Académie des sciences, Comptes rendus, Paris, 1846, tome 23, p. 892–902.) ***EO**

Concludes that xyloïdin and pyroxlin are not identical; they not only differ in physical properties but also in chemical composition. Discusses utilization of these materials as military explosives.

1051. Kindt. Über die Veränderung der Stärke durch Salpeter-Schwefelsäure, über Auffindung der Baumwolle in Leinwand, und über Schiessbaumwolle. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1847, Bd. 70, p. 167–171.) **PAA**

A microscopic study of the transformation of starch when treated with a mixture of nitric and sulphuric acids.

Abstract in *Jour. prakt. Chem.,* 1846, Bd. 39, p. 378–379.

1052. Payen, A. Note sur la pyroxyline, le coton hypoazotique et la xyloïdine. (Académie des sciences, Comptes rendus, Paris, 1847, tome 24, p. 85–89.) ***EO**

The earlier announcement as to the preparation of xyloïdine is verified. Notes that the starch grains consist of an interior portion which gives an intense blue with iodine, and an outer enveloping substance.

1053. Reinsch, Hugo. Ueber einige explosive Substanzen. (Repertorium für die Pharmacie, Buchner's, Nürnberg, 1849, Reihe 3, Bd. 3, p. 6–20.)

Available in Library of Columbia College of Pharmacy.

Describes starch nitrate.

1054. Béchamp, A. Action des protosels de fer sur la pyroxline et ses congénères. (Académie des sciences, Comptes rendus, Paris, 1853, tome 37, p. 134–135.) ***EO**

Notes that by the action of certain ferrous salts starch may be recovered unchanged from its nitrate (xyloïdine).

Abstract in *Jour. prakt. Chem.,* 1853, Bd. 60, p. 186–187.

1055. —— Faits pour servir à l'histoire de la fécule, du ligneux, de la gomme et de la dulcine. (Académie des sciences, Comptes rendus, Paris, 1860, tome 51, p. 255–258.) ***EO**

Describes nitric acid esters of starch and dextrin.

Reprint in *Jour. prakt. Chem.,* 1861, Bd. 82, p. 120–124; *Journal de pharmacie et de chimie,* 1860, série 3, tome 38, p. 259–263.
Abstract in *Bull. soc. chim. Paris,* 1860, année 2, p. 478–479.

1056. Ritter, Franz. Weisses Schiesspulver. (Dingler's polytechnisches Journal, Augsburg, 1861, Bd. 161, p. 146–147.) **3–VA**

Preparation and explosive properties of starch nitrate.

1057. Béchamp, A. Sur la xyloïdine et sur de nouveaux dérivés nitriques de la fécule. (Annales de chimie et de physique, Paris, 1862, série 3, tome 64, p. 311–344.) **PAA**

Obtains a nitric acid ester containing 6.7% N which is insoluble in the usual organic solvents but is soluble in an aqueous solution of acetic acid. A modification of this ester is soluble in alcohol, ether and acetone. Similarly obtains 2 modifications containing 11% N which differ in their solubilities. The esters are decomposed by the action of ferrous chloride, nitric oxide being liberated and the soluble starch regenerated. Determines rotatory power of the nitrate derivatives.

Condensed in *Bull. soc. chim. Paris,* 1862, année 4, p. 358–361; *Chem. Centr.,* 1862, p. 865–867; *Philosophical magazine,* 1862, v. 24, p. 526–527; *Jahresber. Chem.,* 1862, p. 469–471.

1058. Schuetzenberger, P. Action de l'acide acétique anhydre sur la cellulose, l'amidon, les sucres, la mannite et ses congénères, les glucosides et certaines matières colorantes végétales. (Académie des sciences, Comptes rendus, Paris, 1865, tome 61, p. 485–486.) ***EO**

Notes that starch yields two acetate derivatives; one is insoluble in water, soluble in alcohol and in acetic acid; the other is

Starches and Dextrins, continued.

Ethers and Esters, continued.

soluble in water and alcohol. Dextrin is liberated upon saponification of either compound.

Abstract in *Bull. soc. chim. Paris,* 1866, nouv. série, tome 5, semestre 1, p. 291; *Chem. Centr.,* 1865, Jahrg. 36, p. 1036; *Jour. prakt. Chem.,* 1866, Bd. 97, p. 250; *Jahresber. Chem.,* 1865, p. 594; *Ber.,* 1869, Jahrg. 2, p. 163.

1059. **Schuetzenberger,** P., and NAUDIN. Sur les dérivés acétiques des substances hydrocarbonées. (Académie des sciences, Comptes rendus, Paris, 1869, tome 68, p. 814–818.) ***EO**

When starch is heated with acetic anhydride at 140° an acetyl derivative is obtained from which the insoluble starch may be regenerated. When prepared at 150°, soluble starch is obtained by saponification and when prepared at higher temperatures, dextrin is the saponification product. Determine elementary composition and rotatory power of the acetyl derivatives.

Reprint in *Chem. Zentr.,* 1869, p. 681–683; *Zeitschrift für Chemie,* Leipzig, 1869, Jahrg. 12, p. 264–266.

More detailed account in *Bull. soc. chim. Paris,* 1869, nouv. série, tome 12, semestre 2, p. 107–113.

1060. **Schuetzenberger,** P. Mémoire sur les dérivés acétiques des principes hydrocarbonés de la mannite et de ses isomères, et de quelques autres principes immédiats végétaux. (Annales de chimie et de physique, Paris, 1870, série 4, tome 21, p. 235–264.) **PAA**

A continuation of *entry 1058.*

By treating starch at 140° and 150° with acetic anhydride, obtains the triacetate of starch and soluble starch, respectively, both of which may be regenerated upon treatment with alkali.

Reprinted in *Annalen der Chemie und Pharmacie,* Liebig's, 1871, Bd. 160, p. 74–100, *PKA.*

Condensed in *Jour. chem. soc.,* 1872, v. 25, p. 66–71.

1061. **Berthelot.** Action de l'acide azotique sur les carbures d'hydrogène et sur les alcools. (Annales de chimie et de physique, Paris, 1876, série 5, tome 9, p. 316–328.) **PAA**

On p. 328 notes amount of heat evolved in the formation of xyloïdin by the action of concentrated HNO_3 on starch.

1062. **Liechti,** L., and W. SUIDA. Ueber die Zusammensetzung der sogenannten Türkischrothöle. (Abgekürzt.) (Deutsche chemische Gesellschaft, Berichte, Berlin, 1883, Jahrg. 16, p. 2453–2458.) **PKA**

The oxyoleic acid-starch-sulphuric acid and oxyoleic acid-dextrin-sulphuric acid esters were prepared by heating the starch or dextrin with sulphuric and oleic acids. The compounds are soluble in water, yield metallic salts and are decomposed by boiling alkali with formation of oxyoleic acid.

Also summarized in *Jahresber. Chem.,* 1883, p. 1789–1792.

1063. **Michael,** A. Action of acetic anhydride and acetic chloride on maize and potato-starch. (American chemical journal, Baltimore, 1883, v. 5, p. 359–360.) **PKA**

When acetylated with acetic anhydride the characteristic forms of the potato and corn granules are not changed. The action of acetyl chloride seems to be accompanied by hydrolysis of the starch molecule.

Abstract in *Jour. chem. soc.,* 1884, v. 46, p. 420.

1064. **Berthelot.** Sur la vitesse de propagation de la détonation dans les matières explosives, solides et liquides. (Académie des sciences, Comptes rendus, Paris, 1885, tome 100, p. 314–320.) ***EO**

Xyloidin is included among the substances studied.

Reprinted in further detail in *Annales de chimie et de physique,* 1885, série 6, tome 6, p. 556–574, *PAA.*

Condensed in *Bull. soc. chim. Paris,* 1885, nouv. série, tome 43, semestre 1, p. 536–538.

Abstract in *Jour. chem. soc.,* 1885, v. 48, p. 478.

1065. **Hoenig,** Max, and STANISLAUS SCHUBERT. Über Ätherschwefelsäuren einiger Kohlenhydrate. (Akademie der Wissenschaften zu Wien, Sitzungsberichte, Mathematisch-naturwissenschaftliche Classe, 1885, Bd. 92, Abt. 2, p. 737–778.) ***EF**

Starch and cellulose are treated with concentrated H_2SO_4 and the calcium, barium and lead salts of the resulting compounds prepared.

Also in *Monatshefte für Chemie,* Wien, 1886, Bd. 6, p. 708–749.

Abstract in *Jour. chem. soc.,* 1886, v. 50, p. 44; *Chem. Centr.,* 1885, p. 962; *Jahresber. Chem.,* 1885, p. 1575–1577; *Bull. soc. chim. Paris,* 1886, nouv. série, tome 46, semestre 2, p. 517–520.

1066. —— Zur Kenntnis der Kohlenhydrate. 1. (Monatshefte für Chemie, Wien, 1886, Bd. 7, p. 455–484.)

Available in Library of Columbia University.

A further investigation of the H_2SO_4 derivatives of starch and cellulose described in *entry 1065.* Discuss constitution of starch.

Abstract in *Jour. chem. soc.,* 1887, v. 52, p. 125; *Chem. Zentr.,* 1886, p. 881; *Bull. soc. chim. Paris,* 1887, nouv. série, tome 47, semestre 1, p. 578; *Jahresber. Chem.,* 1886, p. 1780–1782.

1067. **Muehlhaeuser,** O. Die höheren Saltpetersäureäther der Stärke. (Dingler's polytechnisches Journal, Stuttgart, 1892, Bd. 284, p. 137–143.) **3–VA**

Gives a short history of nitro-starch. Obtains various nitration products with nitrogen content ranging from 10.5% to

Starches and Dextrins, continued.

Ethers and Esters, continued.

13.5%. Also shows that the compounds are not nitro-bodies but true esters.

Abstract in *Jour. soc. chem. ind.*, 1892, v. 11, p. 708; *Chem. Centr.*, 1892, Bd. 1, p. 982; *Jour. chem. soc.*, 1893, v. 64, part 1, p. 6.

Condensed in *Wag. Jahr.*, 1892, Jahrg. 38, p. 374–376.

1068. Cross, Charles F., and others. The interaction of alkali-cellulose and carbon bisulphide. By C. F. Cross, E. J. Bevan, and C. Beadle. (Chemical Society of London, Journal, 1893, v. 63, p. 837–845.) **PKA**

Work includes determination of carbon in a benzoate of soluble starch; the benzoate is prepared by treating the alkali addition compound of soluble starch with benzoyl chloride.

1069. Boettinger, Carl. Zur Kenntnis der Glyoxylsäure. 6. Verhalten gegen Kohlenhydrate. (Archiv der Pharmazie, Berlin, 1895, Bd. 233, p. 287–294.)

Available in Library of the Chemists' Club.

Notes that glyoxylic acid hydrolyzes starch to glucose. In the presence of an excess of the acid an ester appears to be formed.

1070. Will, Wilhelm, and Friedrich Lenze. Nitrierung von Kohlehydraten. (Deutsche chemische Gesellschaft, Berlin, Berichte, 1898, Jahrg. 31, p. 68–90.) **PKA**

A number of carbohydrates are treated with a mixture of concentrated nitric and sulphuric acids. Starch is nitrated by two methods with production of very similar substances containing 14.04% and 13.90% nitrogen. These products considered as hexanitrates, are soluble in alcohol and ethyl acetate, are completely stable at 50° and decompose with explosive violence at 194°.

Abstract in *Jour. chem. soc.*, 1898, v. 74, part 1, p. 227–229; *Chem. Centr.*, 1898, Bd. 1, p. 441–444.

1071. Brown, Horace T., and J. H. Millar. Attempts to prepare pure starch derivatives through their nitrates. (Chemical Society of London, Journal, 1899, v. 75, p. 308–315.) **PKA**

Preparations contained 7.8% to 11.5% nitrogen.

On regeneration with ammonium sulphide, soluble starch was obtained in a pure state; but all reducing starch products, such as maltodextrin, amylodextrin, the stable dextrin of their "no. 8 equation" and maltose, showed lower optical activity and reducing power due to oxidation by the nitric acid. The molecular weight of the starch derivative was 987, as determined by freezing point in acetic acid.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 159; *Chem. Centr.*, 1899, Bd. 1, p. 674, 1108; *Bull. soc. chim. Paris*, 1899, série 3, tome 22, p. 797–798.

1072. Pregl, Fritz. Über die Acetylierung von löslicher Stärke. (Monatshefte für Chemie, Wien, 1901, Bd. 22, p. 1049–1066.)

Available in Library of Columbia University.

Soluble potato starch, prepared by Zulkowski's method, gave a triacetyl derivative on treatment with acetic anhydride. The derivative was insoluble in alcohol, molecular weight was 8 or 9 times the empirical formula, α_D=163.6°, and when hydrolyzed the soluble starch was regenerated, α_D=191.27°. Acetylation of the starch with an increased amount of H_2SO_4 gave a triacetyl derivative, soluble in alcohol, melting at 150°, molecular weight 3 times empirical formula, α_D=148.6° and on hydrolysis yielded a dextrin giving a red coloration with iodine, α_D=187°.

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 1, p. 135; *Jour. soc. chem. ind.*, 1902, v. 21, p. 129; *Chem. Centr.*, 1902, Bd. 1, p. 182; *Bull. soc. chim. Paris*, série 3, tome 28, p. 929.

1073. Sapozhnikov, A. V. Determination of the molecular weight of nitro-starch. [Title translated.] (Russian Physical Chemistry Society, Journal, St. Petersburg, 1903, tome 35, p. 126–128.) **PKA**

Samples containing 13.4% N were prepared by two methods. The molecular weights were about 1845 as determined ebulliometrically in acetone.

Abstract in *Jour. chem. soc.*, 1903, v. 84, part 1, p. 402; *Bull. soc chim. Paris*, 1904, série 3, tome 32, p. 218.

1074. Kldiashvili, A. G. Action of some fatty acids on starch. [Title translated.] (Russian Physical Chemistry Society, Journal, St. Petersburg, 1904, tome 36, p. 905–908.) **PKA**

By the action of formic acid obtains the monoformyl derivative of starch. Shows that the ester of ordinary dextrin is not present. Cryoscopic measurements in chloracetic acid and phenol indicate the formula $(C_7H_{10}O_6)_6$. Analogous compounds are obtained by the action of mono-, di-, and trichloracetic acids.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 1, p. 798; *Chem. Centr.*, 1904, Bd. 2, p. 1029; *Bull. soc. chim. Paris*, 1905, série 3, tome 34, p. 1173.

1075. Cross, Charles F., and others. Die niederen Acetylderivate von Stärke und Cellulose. Von Charles F. Cross, Edward J. Bevan und John Traquair. (Chemiker-Zeitung, Cöthen, 1905, Jahrg. 29, p. 527–528.) **†† VOA**

Tabulate results showing that the extent of the action of glacial acetic acid on starch

Starches and Dextrins, continued.

Ethers and Esters, continued.

at 100–105° is proportional to the time of heating and ratio of acid to starch. The lowest product in the series exhibits the physical characteristics of gelatine when in solution, and upon drying forms a transparent, elastic membrane.

Abstract in *Chem. Centr.*, 1905, Bd. 2, p. 36.

1076. **Kldiashvili**, A. G. Dichloracetic ester of dextrine. [Title translated.] (Russian Physical Chemistry Society, Journal, St. Petersburg, 1905, tome 37, p. 421–423.)

Available in Library of the Chemists' Club.

Rice starch is refluxed with twice its weight of dichloracetic acid. Molecular weight of the ester, in acetone, by boiling point elevation indicates a sextuple molecular.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 1246; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 634; *Chem. Centr.*, 1905, Bd. 2, p. 401; *Bull. soc. chim. France*, 1907, série 4, tome 2, p. 141.

1077. **Skraup**, Zdenko H., and others. Über Stärke, Glykogen und Zellulose. By Zdenko H. Skraup, E. Geinsperger, E. von Knaffl-Lenz, Franz Menter, und H. Sirk. (Monatshefte für Chemie und verwandte Teile anderer Wissenschaften, Wien, 1905, Bd. 26, p. 1415–1472.)

Available in Library of Columbia University.

Obtain a large number of chloracetylated products by treating starch with acetic anhydride saturated with HCl. The compound, from which soluble starch is regenerated by hydrolysis, contains 0.268% chlorine, indicating a minimum molecular weight of 7440 for the soluble starch. The compound $(C_6H_7O_5)_6Ac_{19}Cl$, from which erythrodextrin is obtained by hydrolysis, contains 1.92% chlorine and shows a molecular weight of 1700–2000 by ebullioscopic measurements. Also obtain acetyl-chloromaltose and tetra-acetyl-chlorodextrose by prolonged treatment of starch.

Abstract in *Jour. chem. soc.*, 1906, v. 90, part 1, p. 67–68; *Jour. soc. chem. ind.*, 1906, v. 25, p. 43; *Chem. Centr.*, 1906, Bd. 1, p. 655–657; *Jahresber. Chem.*, 1905–08, Bd. 2, p. 929–931; *Bull. soc. chim. Paris*, 1906, série 3, tome 36, p. 591–592; *Bull. assoc. chimistes*, 1905–06, tome 23, p. 1348.

1078. **Cross**, Charles F., and others. Interaction of alkali starch and carbon disulphide. Xanthogenic esters of starch. By C. F. Cross, E. J. Bevan and J. F. Briggs. (Chemical Society of London, Journal, 1907, v. 91, p. 612–614.) **PKA**

Dry starch is saturated with carbon disulphide, NaOH stirred in, the product dissolved in water, the solution acidified and treated with iodine solution. Starch dixanthogenate is precipitated by the iodine in proportions closely corresponding to the percentage calculated from the quantity of the original starch taken.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 628; *Chem. Centr.*, 1907, Bd. 2, p. 42; *Bull. soc. chim. France*, 1907, série 4, tome 2, p. 1416.

1079. **Berl**, E., and Watson Smith. On some simple and mixed esters of cellulose. (Society of Chemical Industry, Journal, London, 1908, v. 27, p. 534–538.) **VOA**

p. 538. Starch nitrate containing 14.08% nitrogen was treated with alcoholic NaOH and, after acidifying the sodium salt, a substance was obtained whose osazone resembled that of oxypyruvic acid.

Abstract in *Chem. Centr.*, 1908, Bd. 2, p. 686.

1080. **Law**, Douglas J. Untersuchungen über Acetylierung. (Chemiker-Zeitung, Cöthen, 1908, Jahrg. 32, p. 365–366.) † **VOA**

Notes that a mixture of acetic anhydride and acetic acid in the presence of a large amount of $ZnCl_2$ does not acetylate or even hydrolyze starch. Whereas, under the same conditions, cellulose forms the triacetate.

Abstract in *Jour. chem. soc.*, 1908, v. 94, part 1, p. 321; *Bull. soc. chim. France*, 1909, série 4, tome 6, p. 157.

1081. **Traquair**, John. The manufacture and properties of some starch esters. (Society of Chemical Industry, Journal, London, 1909, v. 28, p. 288–291.) † **VOA**

Believes that starch is a coagulated substance solidified in the plant from an apparently dissolved state. Discusses the formation and properties of starch nitrate, formate and acetate. Gives the manufacture, properties and uses of "feculose," an acetic ester of starch. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1909, Bd. 1, p. 1987; *Bull. assoc. chimistes*, 1910–11, tome 28, p. 427–428; *Bull. soc. chim. France*, 1909, série 4, tome 6, p. 1052.

1082. **Berl**, E., and Rob. Bütler. Zur Kenntnis der Stärkenitrate. (Zeitschrift für das gesamte Schiess- und Sprengstoffwesen, München, 1910, Jahrg. 5, p. 82–84.) **3–VOA**

Treat 4 varieties of starch with a mixture of nitric and fuming sulphuric acids and obtain nitrates containing 12.86–13.85% N. Make determinations of viscosity, solubility in alcohol and ether, ignition point and hygroscopicity. A 5% solution of cellulose nitrate in acetone has more than 9000 times the viscosity of a corresponding starch nitrate solution, the N content of both being about 13 per cent.

Abstract in *Chem. abst.*, 1910, v. 4, p. 1556; *Jour. soc. chem. ind.*, 1910, v. 29, p. 373; *Chem. Zentr.*, 1910, Bd. 1, p. 2074.

1083. **Ost**, H., and others. Zellstoffviscose und Stärkeviscose. Von H. Ost, F. West-

Starches and Dextrins, continued.

Ethers and Esters, continued.

hoff und L. Gessner. (Liebig's Annalen der Chemie, Leipzig, 1911, Bd. 382, p. 340–360.) **PKA**

Starch is treated with a 5–20% solution of NaOH and with carbon disulphide, after 24 hours the viscose is separated by pouring the mixture into alcohol. Analyses indicate two atoms of sulphur and two of sodium per molecule of starch, so that it is regarded as a normal sodium xanthogenate. The compound undergoes a progressive decomposition with corresponding decrease in viscosity, although the decomposition is slower than in the case of cellulose viscose.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 1024; *Chem. abst.*, 1911, v. 5, p. 3574–3575; *Jour. chem. soc.*, 1911, v. 100, part 1, p. 710–711; *Chem. Zentr.*, 1911, Bd. 2, p. 1120–1123; *Bull. soc. chim. France*, 1912, série 4, tome 12, p. 269.

1084. Worden, Edward C. Stärkeazetat. (Kunststoffe, München, 1913, Jahrg. 3, p. 61–63.) **†† VA**

A review.

1085. Böeseken, J., and others. Quelques observations concernant l'acétylation et l'acétolyse de la cellulose et de l'amidon au moyen d'anhydride acétique. Par J. Böeseken, J. C. v. d. Berg et A. H. Kerstjens. (Recueil des travaux chimiques des Pays-Bas, Leyde, 1915, tome 35, p. 320–345.) **PKA**

The velocity of acetylation of wheat starch is less than that of cellulose. Of a number of substances examined, HI proved to be the best catalyst. In the case of sulphuric acid an increase in the amount of acid used produces an acceleration of the esterification, but not to an extent proportional to the amount of catalyst employed.

Abstract in *Chem. abst.*, 1917, v. 11, p. 39–41; *Jour. soc. chem. ind.*, 1916, v. 35, p. 464; *Chem. Zentr.*, 1916, Bd. 2, p. 173–174; *Bull. soc. chim. France*, 1916, série 4, tome 19, p. 400.

1086. Cope, W. C., and J. Barab. "Nitron" as a gravimetric reagent for the analysis of substances used in explosives. (American Chemical Society, Journal, Easton, 1917, v. 39, p. 504–514.) **PKA**

Include comparative determinations of nitrogen in nitrostarch by the nitrometer and by the "nitron" method.

1087. Sadtler, S. S. Nitrostarch as an explosive. (Metallurgical and chemical engineering, New York, 1917, v. 16, p. 361–364.) **VOA**

Nitrostarch containing 12–13.3% N is prepared and its properties described in detail.

Abstract in *Chem. abst.*, 1917, v. 11, p. 1750.

1088. Kerb, Johannes. Über eine Verbindung der Stärke mit Phosphorsäure. (Biochemische Zeitschrift, Berlin, 1919, Bd. 100, p. 3–14.) **PPB**

A solution of starch was treated with phosphorus oxychloride in chloroform in the presence of calcium carbonate. After concentration of the solution, the Ca salt of an amylophosphoric acid was precipitated with alcohol. A similar Pb salt was prepared. Hydrolysis with HCl was unsatisfactory, but with taka diastase the Ca salt of a hexosemonophosphoric acid was obtained.

Abstract in *Chem. abst.*, 1920, v. 14, p. 2341; *Chem. Zentr.*, 1920, Bd. 1, p. 284.

1089. West, Clarence J. Alkyl ethers of starch. (Paper, New York, v. 27, Oct. 6, 1920, p. 16, 36.) **† VMPA**

Discusses raw materials used, method of preparation of ethers and their properties and uses.

1090. Gomberg, M., and C. C. Buchler. Benzyl ethers of carbohydrates. (American Chemical Society, Journal, Easton, 1921, v. 43, p. 1904–1911.) **PKA**

By treatment with benzyl chloride and NaOH, prepare benzyl ethers of several carbohydrates. Potato starch dextrin, potato starch and corn starch take up 1, 1, and 2 benzyl groups, respectively, for each C_{12} molecule. Because of their properties as colloidal and plastic substances, suggest that they may become technically useful products.

Abstract in *Chem. Zentr.*, 1922, Bd. 1, p. 1396; *Chem. abst.*, 1922, v. 16, p. 59; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 454.

1091. Halen, S. Stärkeazetate. (Kunststoffe, München, 1921, Jahrg. 11, p. 121–123.) **† VA**

A review of the work of Skraup, Pregl, Cross, Bevan, Traquair, Boeseken and Kerstjens.

Condensed in *Chimie et industrie*, 1922, v. 7, p. 548–549.

1092. Kesseler, K., and R. Röhm. Über die Saltpetersäureester der Stärke. (Zeitschrift für angewandte Chemie, Leipzig, 1922, Jahrg. 35, p. 125–128.) **PKA**

A critical review of the nitric acid esters of starch. Nitration processes and properties of the resulting compounds are tabulated.

1093. Pringsheim, Hans, and Max Lassmann. Über Inulin und Glykogen. (Zweite Mitteilung über Inulin.) (Deutsche chemische Gesellschaft, Berichte, Berlin, 1922, Jahrg. 55, p. 1409–1414.) **PKA**

Work includes preparation of starch acetate by treatment of Zulkowski's soluble starch with acetic anhydride in presence of pyridine. Starch and glycogen, without

Starches and Dextrins, continued.

Ethers and Esters, continued.

traces of reducing impurities, were recovered from their acetates. Solubility of the acetates and I coloration of the regenerated carbohydrates, contradict the suggestion of Karrer as to identity of starch and glycogen.

Abstract in *Jour. chem. soc.*, 1922, v. 122, part 1, p. 634; *Chem. abst.*, 1922, v. 16, p. 3878; *Chem. Zentr.*, 1922, Bd. 3, p. 757; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 1557.

1094. **Chowdhury**, J. K. Über Äther von Polysacchariden mit Oxysäuren. (Biochemische Zeitschrift, Berlin, 1924, Bd. 148, p. 76–97.) **PPB**

Ethers are prepared by the action of chloracetic acid on the polysaccharides in the presence of concentrated NaOH. In the case of starch 2 molecules of acid were introduced for each glucose residue; the remaining hydroxyl groups were partially methylated by means of methyl sulphate and NaOH.

Abstract in *Chem. abst.*, 1925, v. 19, p. 640; *Jour. chem. soc.*, 1924, v. 126, part 1, p. 1029; *Chem. Zentr.*, 1924, Bd. 2, p. 622–623.

1095. **Escales**, R., and H. Levy. Über die Verwendbarkeit und die katalytische Wirkungsweise aromatischer Sulfofettsäuren bei der Herstellung hochmolekular Ester. (Kunststoffe, München, 1923, Jahrg. 13, p. 25–28, 52–55, 64–68.) **VA**

Using several sulpho-fatty acids as catalysts in the acetylation of cellulose and starch, find that temperatures up to 80° can be used without destructive depolymerization. The starch acetate is very hygroscopic and its viscosity is considerably lower than that of the corresponding cellulose ester.

Abstract in *Chem. Zentr.*, 1923, Bd. 3, p. 486.

1096. **Gault**, H. Les éthers-sels solubles de l'amidon et des acides gras supérieurs. (Académie des sciences, Comptes rendus, Paris, 1923, tome 177, p. 592–593.) ***EO**

Starch is mixed with lauryl chloride, pyridine and toluene and heated for 2 hours at 100°. Upon precipitation by alcohol from the toluene solution an 80% yield of the dilaurate is obtained. The ester is noninflammable and is soluble in $CHCl_3$ and C_6H_6.

Abstract in *Bull. soc. chim. France*, 1923, série 4, tome 34, p. 2124.

1097. **Karrer**, Paul, and Zorka Zega. Zur Kenntnis der Fettsäure-Ester von polymeren Kohlenhydraten. (Helvetica chimica acta, Basel, 1923, v. 6, p. 822–826.) **PKA**

"Zulkowski's starch" is refluxed for 4 hours with quinoline and a fatty acid chloride. Prepare starch-hexapalmitate and starch-hexastearate and determine melting point, C and H content, saponification number, specific rotation and solubility in various solvents.

Abstract in *Chem. abst.*, 1924, v. 18, p. 80; *Chem. Zentr.*, 1923, Bd. 3, p. 1454.

1098. **Tamba**, R. Über einen Schwefelsäure-Ester der Stärke. (Biochemische Zeitschrift, Berlin, 1923, Bd. 141, p. 274–277.) **PPB**

Vacuum dried starch is slowly introduced into a heated mixture of chlorsulphonic acid and $CHCl_3$ in dry pyridine. The resulting product, upon purification and analysis of its K salt, is shown to be an amylodisulphuric acid. It has no reducing action and does not give a blue coloration with I.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1475.

1099. **Tomecko**, C. G., and Roger Adams. The allyl ethers of various carbohydrates. (American Chemical Society, Journal, Easton, 1923, v. 45, p. 2698–2701.) **PKA**

The carbohydrates are treated with allyl bromide in an aqueous alkaline solution or suspension. Prepare and describe mono-allyl dextrin, mono-allyl potato starch and mono-allyl corn starch.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1650; *Chem. Zentr.*, 1924, Bd. 1, p. 1915.

1100. **Gault**, H., and M. P. Ehrmann. Les éthers-sels des acides gras supérieurs et de quelques hydrates de carbone. (Chimie et industrie, Paris, Special exposition no., May, 1924, p. 574.) **VOA**

Di-esters of starch are prepared.

Abstract in *Chem. abst.*, 1925, v. 19, p. 251.

1101. **Helferich**, Burckhardt, and Hans Koester. Äther des Triphenyl-carbinols mit Cellulose und Stärke. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1924, Jahrg. 57, p. 587–591.) **PKA**

Ethers are prepared by heating the polysaccharides with pyridine and triphenylchlor-methane. The products are easily decomposed by acids and are soluble in a number of organic solvents. Give details of preparation of triphenylmethyl-starch and its chloracetyl derivative.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2873; *Chem. Zentr.*, 1924, Bd. 1, p. 2104.

1102. **Schmid**, L. Methylierungsversuche bei Polysacchariden. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1925, Jahrg. 58, p. 1963–1965.) **PKA**

Soluble starch is treated with diazomethane.

Abstract in *Chem. abst.*, 1926, v. 20, p. 743.

1103. **Wolffenstein**, R., and E. Oeser. Über die Xanthogenate von Cellulosen. (Auszug.) (Chemisches Zentralblatt, Leipzig und Berlin, 1925, Bd. 2, p. 366.) **PKA**

Prepare starch xanthogenate.

HYDROLYSIS BY SALTS

1104. **Biedermann,** W. Fermentstudien. 2. Die Autolyse der Stärke. (Fermentforschung, Leipzig, 1914–16, Bd. 1, p. 474–504.) **PPH**

Notes that starch solutions prepared at 70–90° undergo spontaneous hydrolysis. The hydrolysis by saliva ash reported previously, is also shown to be effected by the separate salt constituents although not in as marked degree.

Reprinted in *Wochenschrift für Brauerei,* 1917, Jahrg. 34, p. 183–186, 193–195.

Abstract in *Chem. abst.,* 1917, v. 11, p. 1436; *Chem. Zentr.,* 1916, Bd. 2, p. 406.

1105. —— Bemerkung zu meiner Abhandlung über Autolyse der Stärke im 1. Band dieser Zeitschrift. (Fermentforschung, Leipzig, 1919, Bd. 2, p. 200.) **PPH**

Boiled starch solutions after some weeks become infected with a bacterium which forms a S-yellow pigment and hydrolyzes the starch to d-glucose. The bacterium is possibly identical with, or at least closely related to, Schardinger's Bacillus macerans. The previously recorded autolysis of starch was probably due to infection with this microörganism. — *Chem. abst.*

1106. **Sallinger,** Hermann. Entgegnung auf W. Biedermanns "Fermentstudien." 1. und 2. Mitteilung. (Fermentforschung, Leipzig, 1919, Bd. 2, p. 449–457.) **PPH**

A reply to Biedermann (*entry 1104*). Sets out in detail the reasons which lead him to consider the application of extremely dilute solutions, as recommended by Biedermann, unsuitable. Experiments with sterilized starch solution failed to confirm the diastatic action of saliva ash or the autolysis of starch. — *Chem. abst.*

Abstract in *Chem. Zentr.,* 1919, Bd. 3, p. 635.

1107. **Biedermann,** W. Fermentstudien. 4. Zur Autolyse der Stärke. (Fermentforschung, Leipzig, 1919, Bd. 2, p. 458–472.) **PPH**

Repeats earlier experiments with view to excluding the possibility of bacterial action or presence of amylase. Shows that saliva ash or NaCl facilitates the formation of an enzyme in the pure amylose, the autolysis then proceeding unaltered even though the salts are removed.

Abstract in *Jour. chem. soc.,* 1920, v. 118, part 1, p. 15; *Chem. abst.,* 1920, v. 14, p. 1345; *Chem. Zentr.,* 1919, Bd. 3, p. 635.

1108. **Bachrach,** E. Études expérimentales sur la décomposition de l'amidon en présence de salive calcinée. (Société de biologie, Comptes rendus, Paris, 1920, tome 83, p. 1583–1584.) **QAA**

Concludes that there is no decomposition if the ash is kept sterile.

Abstract in *Chem. Zentr.,* 1921, Bd. 1, p. 443.

1109. **Biedermann,** W. Bemerkung zu Wohlgemuths und Sallingers Einwänden gegen meine Versuche über Autolyse der Stärke. (Fermentforschung, Leipzig, 1920, Bd. 3, p. 70–71.) **PPH**

The contradictory results of Wohlgemuth and Sallinger are attributed to a difference in the acidity of the ash.

Abstract in *Chem. abst.,* 1920, v. 14, p. 3681: *Chem. Zentr.,* 1920, Bd. 1, p. 9.

1110. —— Natur und Entstehung diastatischer Fermente. (Münchener medizinische Wochenschrift, München, 1920, Jahrg. 67, p. 1429–1431.)

Available in Library of the New York Academy of Medicine.

NaCl and phosphates are necessary complements to the activity of ptyalin upon amylose. Ashed saliva has the property of digesting amylose, though very slowly. This observation is taken as proof that the enzyme may be formed from the substrate. — *Chem. abst.*

1111. **Schulz,** Fr. N. Über die Wirkung der Speichelasche auf Stärkelösung. (Fermentforschung, Leipzig, 1920, Bd. 3, p. 72–74.) **PPH**

Confirms the findings of Biedermann that saliva-ash aids in autolysis of starch, but hints at the fact that some saliva ashes are strongly alkaline and consequently their addition to starch paste creates a pH which is not favorable to amylolytic action. Adjustment of the acidity starts the action. Urine ash has similar action on starch. — *Chem. abst.*

Abstract in *Chem. Zentr.,* 1920, Bd. 1, p. 8.

1112. **Biedermann,** W. Fermentstudien. 7. Die organische Komponente der Diastasen und das wahre Wesen der "Autolyse" der Stärke. (Fermentforschung, Leipzig, 1921, Bd. 4, p. 359–396.) **PPH**

1. Die diastatische Wirkung ist an einen spezifischen albumoseartigen Proteinstoff gebunden. 2. Die "Autolyse" der Stärke wird durch Fermentspuren veranlasst, die in den Stärkekörnern enthalten sind.

Separates the organic component (zymogen) from saliva by a series of alcohol precipitations. The substance resembles partly a protein and partly an albuminose. Abandoning earlier views as to the autolysis of starch, gives experimental evidence that

Starches and Dextrins, continued.

Hydrolysis by Salts, continued.

the starch grains are contaminated with traces of enzyme.

Abstract in *Jour. soc. chem. ind.*, 1921, v. 40, p. 523A; *Chem. Zentr.*, 1921, Bd. 3, p. 358.

1112A. **Bokorny,** Th. Bemerkungen zu den Versuchen über Reinherstellung von Enzymen. (Allgemeine Brauer- und Hopfen-Zeitung, Nürnberg, 1921, Jahrg. 61, p. 725–726.)

Available in Library of Department of Agriculture.

Includes a discussion of Biedermann's results (*entry 595*). Author attributes the apparent hydrolytic action of salts to activation of amylase present in the starch grains.

Abstract in *Chem. Zentr.*, 1921, Bd. 3, p. 1038.

1113. **Rothlin,** E. Zum Thema: "Natur und Entstehung diastatischer Fermente." (Münchener medizinische Wochenschrift, München, 1921, Jahrg. 68, p. 1393–1395.)

Available in Library of the New York Academy of Medicine.

Believes that the autolysis of amylose as observed by Biedermann is not due to adhering zymogen but to bacterial infection. Reply by Biedermann, *ibid.*, p. 1428.

Abstract in *Chem. abst.*, 1923, v. 17, p. 772; 1922, v. 16, p. 3908.

1114. **Teschendorf,** Werner. Untersuchungen über Neubildung von diastatischem Ferment ausserhalb lebender Zellen. (Fermentforschung, Leipzig, 1921, Bd. 4, p. 184–190.) **PPH**

The author's results fail to confirm the assertion of Biedermann that a diastatic enzyme is formed when dilute solutions of starch are allowed to stand or when starch is brought into contact with the ash of saliva. Biedermann's results are ascribed to the intervention of bacterial action.

Abstract in *Chem. Zentr.*, 1921, Bd. 1, p. 131.

1115. **Rothlin,** E. Beruht der Vorgang der "Autolyse" der Amylose von Biedermann auf einem fermentativen Prozess? (Fermentforschung, Leipzig, 1922, Bd. 5, p. 236–253.) **PPH**

Reply by Biedermann, *ibid.*, p. 254.

Finds the "autolysis" is not specific for saliva ash and does not take place under aseptic conditions. Concludes that the process is due neither to the new formation of enzyme nor to activation of zymogen residues but results from contamination with bacteria or fungi. In reply Biedermann attributes the above contradictory results to unwarranted variations in procedure.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 145B.

1116. —— Zum Thema: "Autolyse" der Stärke. (Antwort auf die Erwiderung von Prof. Biedermann zu meinem diesbezüglichen Artikel.) (Fermentforschung, Leipzig, 1922, Bd. 6, p. 103–104.) **PPH**

1117. —— Natur und Entstehung diastatischer Fermente. (Münchener medizinische Wochenschrift, München, 1922, Jahrg. 69, p. 88–89.)

Available in Library of the New York Academy of Medicine.

Polemic with Biedermann.

1118. **Biedermann,** W. Die Salzhydrolyse der Stärke. 1. (Biochemische Zeitschrift, Berlin, 1923, Bd. 135, p. 282–292.) **PPB**

Various salts are mixed with 1% potato starch solutions, covered with toluene heated to boiling, cooled, aerated and the time required for disappearance of I reaction noted. The mixture containing phosphates, NaCl and glycine reaches the achromic point in 2 hours.

Abstract in *Chem. abst.*, 1923, v. 17, p. 2653; *Chem. Zentr.*, 1923, Bd. 3, p. 663.

1119. —— Die Salzhydrolyse der Stärke. 2. (Biochemische Zeitschrift, Berlin, 1923, Bd. 137, p. 35–52.) **PPB**

Amylose solutions are mixed with phosphates, with NaCl and with KCL. Compares I reaction of mixtures which are stirred by air and of similar mixtures which are not agitated. Results indicate hydrolysis of amylose by salts in presence of oxygen.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 620A; *Chem. Zentr.*, 1923, Bd. 3, p. 834.

1120. **Haehn,** Hugo. Abbau der Stärke durch ein System: Neutralsalze + Aminosäuren + Pepton. (Biochemische Zeitschrift, Berlin, 1923, Bd. 135, p. 587–602.) **PPB**

Potato starch solutions were treated with various combinations of neutral salts and such substances as alanine, leucin, albumose, and peptones. In some cases a disappearance of the I reaction was observed.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 415A; *Chem. Zentr.*, 1923, Bd. 3, p. 565–566.

1121. **Biedermann,** W., and C. JERNAKOFF. Die Salzhydrolyse der Stärke. 3. Hydrolyse durch anorganische Katalysatoren ("künstliche Oxydasen"). (Biochemische Zeitschrift, Berlin, 1924, Bd. 149, p. 309–328.) **PPB**

Give extensive review of literature. Suggest a parallelism between the hydrolysis of starch and the amyloses by salts and the oxydase or peroxidase-like action of the salts towards guaiacum or other oxydase reagents.

Abstract in *Jour. chem. soc.*, 1924, v. 126, part 1, p. 1288; *Chem. Zentr.*, 1924, Bd. 2, p. 1883.

Starches and Dextrins, continued.

Hydrolysis by Salts, continued.

1122. —— Die Salzhydrolyse der Stärke. 4. Hydrolyse durch Blutfarbstoff und pflanzliche Peroxydasen. (Biochemische Zeitschrift, Berlin, 1924, Bd. 150, p. 477–491.) **PPB**

Abstract in *Chem. abst.*, 1925, v. 19, p. 3093; *Chem. Zentr.*, 1924, Bd. 2, p. 2168.

1123. Iljin, W. S. Über den Abbau der Stärke durch Salze. (Biochemische Zeitschrift, Berlin, 1924, Bd. 145, p. 14–17.) **PPB**

Dilute starch solutions in M/500–M/60 NaCl solutions at 25° gave little, if any, color with I after 24 to 72 hours. Other results show similar effects in LiCl and $CaCl_2$ solutions. Author claims priority over Biedermann and Haehn. — *Chem. abst.*

1124. Haehn, Hugo, and Hans Berentzen. Starch decomposition through the system neutral salt + amino acid + peptone. 2. Plasmophilic reaction. (Abstract.) (Chemical abstracts, Easton, 1926, v. 20, p. 1998.) **PKA**

Neutral salt + peptone + amino acids decomposes soluble starch in a catalytic way even at low temperatures. These components are postulated as the constituents of amylase.

SOLUBLE AND MODIFIED STARCHES

1125. Caventou, J. B. Recherches chimiques sur l'amidon et les diverses substances féculantes du commerce. (Annales de chimie et de physique, Paris, 1826, tome 31, p. 337–370.) **PAA**

Studies action of boiling water on various starches and their modifications.

Condensed in *Philosophical magazine*, 1826, v. 58, p. 283–293, 360–370.

Abstract in *American journal of science and arts*, 1828, v. 13, p. 393.

1126. Payen, A. Composition élémentaire de l'amidon de diverses plantes, de ses parties les plus agrégées, de celles qui se désagrégent aisément, et des produits de sa dissolution. (Académie des sciences, Comptes rendus, Paris, 1836, tome 3, p. 224–225.) ***EO**

Concludes that the chemical composition of starch remains fixed although the starch may undergo physical modifications.

Reprinted in further detail with *entry 992* in *Annales de chimie et de physique*, 1837, série 2, tome 65, p. 225–227, *PAA*. The latter is condensed in *Annalen der Pharmacie*, Liebig's, 1838, Bd. 28, p. 271–277, *PKA*, and *Journal für praktische Chemie*, 1838, Bd. 14, p. 65–88, *PKA*.

1127. Schulze, Franz. Ueber das Amidulin. (Journal für praktische Chemie, Leipzig, 1848, Bd. 44, p. 178–179.) **PKA**

Describes amidulin, a substance intermediate between starch and dextrin; it is distinguished by being easily and entirely soluble in hot water. The substance is prepared by boiling starch with dilute H_2SO_4.

1128. Béchamp, Auguste. Nouvelles études sur l'amidon. (Académie des sciences, Comptes rendus, Paris, 1854, tome 39, p. 653–656.) ***EO**

Studies action of HNO_3, H_2SO_4, acetic acid, $ZnCl_2$ and KOH on starch. Obtains a substance which is soluble in cold water and is intermediate between pure dextrin and insoluble starch.

Abstract in *Jour. prakt. Chem.*, 1855, Bd. 64, p. 38–42; *ibid.*, 1855, Bd. 65, p. 296–300; *Jahresber. Chem.*, 1854, p. 622–623.

1129. —— Mémoire sur les produits de la transformation de la fécule et du ligneux sous l'influence des alcalis, du chlorure de zinc et des acides. (Académie des sciences, Comptes rendus, Paris, 1856, tome 42, p. 1210–1213.) ***EO**

A large number of polarimetric observations are carried out on the various starch modifications. Shows that starch, in its natural state, is insoluble, that it undergoes an insensible molecular modification in passing to a state in which it is apparently soluble, that there exists at least two nonfermentable products designated by the term dextrin and finally that all products are transformed into the same sugar.

Reprinted in further detail in *Annales de chimie et de physique*, 1856, série 3, tome 48, p. 458–502, *PAA*.

Abstract in *Annalen der Chemie und Pharmacie*, 1856, Bd. 100, p. 364–368; *Jour. prakt. Chem.*, 1856, Bd. 69, p. 447–450.

1130. Payr, Heinrich von. Über die Einwirkung von Zinnchlorid auf Stärke bei gewöhnlicher Temperatur. (Akademie der Wissenschaften zu Wien, Sitzungsberichte, Mathematisch - naturwissenschaftliche Classe, 1856, Bd. 21, p. 269–271.) ***EF**

When starch is treated with tin chloride a carbohydrate is obtained which is neither starch nor dextrin.

Reprinted in *Jour. prakt. Chem.*, 1856, Bd. 19, p. 425–427.

Abstract in *Chem. Centr.*, 1856, p. 858–859; *Jahresber. Chem.*, 1856, p. 672.

1131. Trécul, A. Des divers états de la substance amylacée. (Académie des sciences, Comptes rendus, Paris, 1858, tome 47, p. 685–689.) ***EO**

Starches and Dextrins, continued.

Soluble and Modified Starches, continued.

1132. **Wicke,** Wilh. Ist Stärke in Wasser löslich? (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1859, Bd. 108, p. 359–360.) **PAA**

Evidence that the grinding of starch with sand and water produces a suspension and not a true solution of starch.

Abstract in *Jahresber. Chem.*, 1859, p. 544; *Bull. soc. chim. Paris*, 1860, tome 2, p. 42.

1133. **Delffs,** W. Ueber das Verhalten der zerriebenen Stärkekörner gegen kaltes Wasser. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1860, Bd. 109, p. 648–655.) **PAA**

Starch is ground with water and sand and the mixture filtered. The filtrate does not show any solid material when examined under the microscope, gives an intense blue iodine coloration and gives a white precipitate with basic Pb acetate and with $Ba(OH)_2$ solution. The substance is termed amylogene.

Abstract in *Bull. soc. chim. Paris*, 1860, année 2, p. 304–305.

1134. **Béchamp,** Auguste. Préparation de l'amidon pour la recherche de l'iode. (Société d'encouragement pour l'industrie nationale, Bulletin, Paris, 1862, année 61, p. 187–188.) **VA**

The starch paste is boiled with alkali, an excess of acetic acid added and the starch precipitated with alcohol.

Abstract in *Polytechnisches Notizblatt*, 1862, Jahrg. 17, p. 270–271; *Jour. prakt. Chem.*, 1862, Bd. 87, p. 128; *Zeit. anal. Chem.*, 1862, Jahrg. 1, p. 466.

1135. **Blondeau,** Ch. Sur le fulminose et le fulminam. (Corps isomères de la cellulose et de l'amidon.) (Annales de chimie et de physique, Paris, 1863, série 3, tome 68, p. 462–472.) **PAA**

Starch is treated with sulphuric acid, dissolved in water and precipitated with alcohol. The product, termed fulminam, decomposes at 120°, whereas dextrin is only decomposed at temperatures above 200°. Fulminam is also obtained when starch nitrate is treated with ammonium hydrosulphide.

Abstract in *Jahresber. Chem.*, 1863, p. 567–568.

1136. **Kabsch,** W. Ueber die Löslichkeit des Stärkemehls und sein Verhalten zum polarisirten Lichte. (Zeitschrift für analytische Chemie, Wiesbaden, 1863, Bd. 2, p. 216–217.) **PKA**

The optical behavior of starches is subject to considerable variations. Prolonged heating with glycerin effects the solution of starches, and by precipitation with alcohol from the glycerine solution, soluble modifications of the starches are obtained. Starches are composed of two individual substances, one of which is dissolved by the action of saliva or dilute acids and by triturating in cold water, whereas the other is not soluble in these media.

Also in *Jour. prakt. Chem.*, 1863, Bd. 88, p. 495–496.

Abstract in *Chem. Centr.*, 1864, p. 303.

1137. **Mueller,** Alex. Dialytische Lösung von Caseïn und Amylum. (Journal für praktische Chemie, Leipzig, 1868, Bd. 103, p. 49–51.) **PKA**

By dialysis of an alkaline starch solution obtains a clear, neutral solution which gives an intense blue coloration with I and from which starch is precipitated by alcohol. Upon evaporation of the solution a paste is formed, which, however, is not gelatinous.

Abstract in *Bull. soc. chim. Paris*, 1868, nouv. série, tome 10, semestre 2, p. 59–60; *Chem. Zentr.*, 1868, p. 1055.

1138. **Vogel,** August. Glycerin als Lösungsmittel für Stärke, Zucker und Gummi. (Deutsche Industriezeitung, Chemnitz, 1868, no. 14, p. 136.) **† VA**

When starch paste is heated with glycerine, a cloudy solution is obtained which forms a deposit on cooling; the supernatent liquid contains starch in true solution.

Abstract in *Bull. soc. chim. Paris*, 1868, nouv. série, tome 10, semestre 2, p. 70.

1139. **Paste** from rice starch. (Abstract.) (Chemical Society of London, Abstracts, 1873, v. 26, p. 1072.) **PKA**

Rice starch is heated with gelatin.

1140. **Musculus,** Fritz. Sur l'amidon soluble. (Académie des sciences, Comptes rendus, Paris, 1874, tome 78, p. 1413–1417.) ***EO**

When ordinary starch is dissolved in boiling dilute H_2SO_4, the acid neutralized and the solution evaporated, small granules of a substance are obtained which are insoluble in cold water but soluble at 50°. This substance, previously termed a dextrin, is now regarded as soluble starch. Gives evidence against the theory of Nägeli that cellulose is present in starch.

Reprinted with further detail in *Annales de chimie et de physique*, 1874, série 5, tome 2, p. 385–397; *Bull. soc. chim. Paris*, 1874, nouv. série, tome 22, semestre 2, p. 26–32; *Journal de pharmacie et de chimie*, Paris, 1874, série 4, tome 20, p. 39–43.

Abstract in *Jour. chem. soc.*, 1874, v. 27, p. 1077, 1174; *Wag. Jahr.*, 1875, Jahrg. 21, p. 771–774; *American chemist*, 1875, v. 5, p. 145, 192; *Jahresber. Chem.*, 1874, p. 881–882.

1141. **Vogel,** August. Löslichkeit des Stärkemehles in Wasser. (Neues Repertorium für Pharmacie, Büchner's, München, 1874, Bd. 23, p. 7.)

Available in Library of Surgeon General's Office.

Preparation of starch solution for indicator purposes.

Abstract in *Chem. Centr.*, 1874, p. 99; *Jahresber. Chem.*, 1874, p. 879.

Starches and Dextrins, continued.

Soluble and Modified Starches, continued.

1142. **Bondonneau,** Lucien. De l'amylogène ou amidon soluble. (Académie des sciences, Comptes rendus, Paris, 1875, tome 80, p. 671–673.) ***EO**

Discusses preparation and solubility in NaOH and in $ZnCl_2$ solutions.

Abstract in *Jour. chem. soc.,* 1875, v. 28, p. 629; *Ber.,* 1875, Jahrg. 8, p. 438; *Jahresber. Chem.,* 1875, p. 787–788.

1143. **Zulkowski,** Karl. Verhalten der Stärke gegen Glycerin. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1880, Jahrg. 13, p. 1395–1398.) **PKA**

Soluble modifications of potato, rice and wheat starch are prepared by dissolving in glycerol at 190° and precipitating with alcohol after the solution has cooled. The concentrated aqueous solution slowly deposits insoluble starch. Dilute solutions are precipitated by lime and baryta water.

Abstract in *Jour. chem. soc.,* 1880, v. 38, p. 865; *Chem. Centr.,* 1880, p. 613; *Bull. soc. chim. Paris,* 1881, nouv. série, tome 36, p. 271–273.

1144. **Mueller,** Alex. Stärkelösung für Jodreaktion. (Landwirtschaftliches Versuchs-Stationen, Berlin, 1882, Bd. 27, p. 340.)

Available in Library of the Department of Agriculture.

The starch is treated with alkali.

Abstract in *Chem. Centr.,* 1882, p. 518.

1145. **Foerster,** Otto. Darstellung von löslicher Stärke und Stärkelösung. (Chemiker-Zeitung, Cöthen, 1897, Jahrg. 21, p. 41.) **††VOA**

Boils starch paste with dilute HCl until solution is clear; precipitates with alcohol. Starch solution is stabilized by addition of glycerin.

Abstract in *Jour. chem. soc.,* 1898, v. 74, part 1, p. 61; *Jour. soc. chem. ind.,* 1897, v. 16, p. 251; *Chem. Centr.,* 1897, Bd. 1, p. 408; *Bull. assoc. chimistes,* 1897–98, tome 15, p. 769.

1146. **Wróblewski,** Augustin. Ueber die lösliche Stärke. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1897, Jahrg. 30, p. 2108–2110.) **PKA**

Differentiates between soluble starch and amylodextrin. Gives details of preparation of soluble starch by aid of dilute KOH solution, and purification by precipitation with alcohol.

Abstract in *Jour. chem. soc.,* 1898, v. 74, part 1, p. 8; *Jour. soc. chem. ind.,* 1897, v. 16, p. 1028; *Chem. Centr.,* 1897, Bd. 2, p. 842; *Jahresber. Chem.,* 1897, p. 1518; *Wag. Jahr.,* 1897, Jahrg. 43, p. 788; *Bull. soc. chim. Paris,* 1898, série 3, tome 20, p. 302.

1147. —— Ueber die Eigenschaften der löslichen Stärke und über eine einfache Methode zur Darstellung derselben. (Chemiker-Zeitung, Cöthen, 1898, Jahrg. 22, p. 375–376.) **VOA**

The soluble form is prepared by boiling rice starch with 0.5% KOH. Neutralizes with acetic acid and precipitates with alcohol. Regards Syniewski's soluble starch as an oxidation product.

Condensed in *Bull. assoc. chimistes,* 1898–99, tome 16, p. 597–599.

Abstract in *Jour. chem. soc.,* 1899, v. 76, part 1, p. 324; *Jour. soc. chem. ind.,* 1898, v. 17, p. 778; *Chem. Centr.,* 1898, Bd. 2, p. 19; *Jahresber. Chem.,* 1898, p. 1353.

1148. **Higgins.** Preparation of soluble starch, dextrins, etc. (Abstract.) (Society of Chemical Industry, Journal, London, 1900, v. 19, p. 1126.) **VOA**

Crude corn starch is heated to the gelatinizing temperature with a solution of sulphuric and boric acids. The mixture is then neutralized with caustic soda and allowed to cool.

1149. **Virneisel,** Ferd. New method of preparing soluble starch. (Abstract.) (Society of Chemical Industry, Journal, London, 1900, v. 19, p. 548.) **†VOA**

Soluble starch is prepared by treating starch paste with 2% sulphuric acid at a temperature of 55°.

1150. **Thomas,** P. Preparation of soluble starch. (Abstract.) (Society of Chemical Industry, Journal, London, 1902, v. 21, p. 1033.) **PKA**

A paste containing 2% starch is heated for 3 hours at 140°.

1151. **Welwart,** N. Über die Verwendung der Ameisensäure zur Herstellung von Verdickungsmitteln und löslicher Stärke. (Chemiker-Zeitung, Cöthen, 1907, Jahrg. 31, p. 126.) **††VOA**

The simplest means of converting starch into the soluble modification is to boil the thin paste with a little formic acid, which is subsequently completely expelled by a single boiling. Owing to this action upon starch, formic acid is unsuitable for the preparation of stiffening agents, the starch becoming much thinner than when acetic acid is used.

Abstract in *Jour. soc. chem. ind.,* 1907, v. 26, p. 216; *Chem. Zentr.,* 1907, Bd. 1, p. 1467.

1152. **Fouard,** Eugène. Recherches sur la constitution physico-chimique de l'amidon. (International Congress of Applied Chemistry, 7th, London, 1909, Proceedings, section 6b, p. 129–132.) **PKR**

Describes the "perfect" starch solutions, which are prepared by gentle treatment of starch granules with dilute HCl and by filtering starch solutions through a collodion membrane.

Starches and Dextrins, continued.

Soluble and Modified Starches, continued.

1153. **Mathieu,** L. Du choix de l'empois d'amidon réactif de l'iode dans les dosages par liqueurs titrées. (Association des chimistes, Bulletin, Paris, 1909–10, tome 27, p. 1166–1168.) **VOA**

Recommends the soluble starch prepared by method of Fernbach and Wolff. Gives details of preparation.

Reprint in *Annales de chimie analytique,* Paris, 1911, tome 16, p. 51–52.

Abstract in *Chem. abst.,* 1910, v. 4, p. 2617; *Jour. soc. chem. ind.,* 1911, v. 30, p. 309.

1154. **Tanret,** Charles. Sur l'amidon soluble. (Académie des sciences, Comptes rendus, Paris, 1909, tome 148, p. 1775–1776.) * **EO**

Soluble starch prepared according to the method of Fernbach is not a definite substance but a mixture of compounds which differ in their rotatory powers, reducing action on Fehling's solution, action with iodine and solubility in alcohol.

Abstract in *Jour. soc. chem. ind.,* 1909, v. 28, p. 847; *Jour. chem. soc.,* 1909, v. 96, part 1, p. 556; *Chem. Zentr.,* 1909, Bd. 2, p. 592.

Printed in detail in *Bull. soc. chim. France,* 1909, série 4, tome 5, p. 902–905. Abstract in *Chem. Zentr.,* 1909, Bd. 2, p. 1637; *Jahresber. Chem.,* 1909, Bd. 2, p. 374.

1155. **Clark,** Ernest D. A study of Lintner soluble starch. (Biochemical bulletin, New York, 1911–12, v. 1, p. 194–206.) **PPB**

Lintner's soluble starch is shown to be a mixture of soluble starch, erythrodextrins and possibly sugar.

Abstract in *Chem. abst.,* 1912, v. 6, p. 1161.

1156. **Fernbach,** Auguste. Sur une nouvelle forme d'amidon soluble. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 13, p. 131–132.) **PKR**

A weak aqueous solution of potato starch is poured into acetone; the precipitate obtained is soluble in cold water, filters readily, possesses no rotatory power, gives an intense blue I reaction and is readily saccharified by malt.

Also in *Académie des sciences, Comptes rendus,* Paris, 1912, tome 155, p. 617–618.

Abstract in *Jour. soc. chem. ind.,* 1912, v. 31, p. 92; *Chem. Zentr.,* 1912, Bd. 2, p. 1812; *Bull. assoc. chimistes,* 1912–13, tome 30, p. 185.

1157. **Gies,** William J. A convenient method of preparing starch that swells rapidly in water. (Biochemical bulletin, New York, 1912–13, v. 2, p. 172–173.) **PPB**

Starch suspension is poured into boiling water, and, after rapid cooling, the starch is precipitated with alcohol.

Abstract in *Chem. abst.,* 1915, v. 9, p. 3079.

1158. **Herstein,** B. Modified starch. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 13, p. 177–181.) **PKR**

Describes widely varying forms of "modified starch."

Abstract in *Chem. abst.,* 1912, v. 6, p. 3035.

1159. **Witlich,** M. Einige Betrachtungen und Untersuchungen über lösliche Stärken. (Kunststoffe, München, 1912, Jahrg. 2, p. 61–64.) †† **VA**

Soluble starches are prepared by the acid and alkali processes; their sodium compounds are prepared and described.

Abstract in *Chem. abst.,* 1912, v. 6, p. 2337; *Bull. assoc. chimistes,* 1911–12, tome 29, p. 866.

1160. **Chapin,** R. M. Preparation of dry starch, soluble in cold water, for use as an indicator. (Journal of industrial and engineering chemistry, Easton, 1914, v. 6, p. 649–650.) † **VOA**

The starch is digested with dilute HCl, neutralized with NH_4OH and precipitated with 95% alcohol.

Abstract in *Chem. Zentr.,* 1914, Bd. 2, p. 1122.

1161. **Samec,** Max, and S. Jencic. Studien über Pflanzenkolloide. 5. Zur Kenntnis der löslichen Stärke. (Kolloidchemische Beihefte, Dresden and Leipzig, 1915, Bd. 7, p. 137–171.) **PKA**

Prepare soluble starches by heating with water under pressure, by acetone precipitation, by action of acid, by method of Lintner and of Kahlbaum, by freezing coagulation, by drying in vacuo, by heating with glycerol and by action of sodium peroxide. In most cases determine osmotic pressure, electrical conductivity of solutions, P content, reducing power and viscosity. The formation of soluble starch is generally accompanied by a reduction in size of the molecule. The wide variations in properties show the term "soluble starch" does not adequately define the substance.

Abstract in *Chem. abst.,* 1916, v. 10, p. 289; *Jour. chem. soc.,* 1915, v. 108, part 1, p. 941; *Chem. Zentr.,* 1915, Bd. 2, p. 945–948.

1162. **Leulier,** A. Préparation d'amidon soluble. (Journal de pharmacie et de chimie, Paris, 1918, série 7, tome 18, p. 291.)

Available in Library of New York Academy of Medicine.

Twenty-five grams of rice, maize, or wheat starch, 100 grams 95% alcohol, and 5 grams of sulphuric acid are boiled together for 15 minutes under a reflux condenser, the starch collected on a filter and washed free from acid. The white product is very soluble in hot water.

Abstract in *Chem. abst.,* 1919, v. 13, p. 915; *Jour. soc. chem. ind.,* 1919, v. 38, p. 86A; *Chem. Zentr.,* 1919, Bd. 2, p. 857.

Starches and Dextrins, continued.

Soluble and Modified Starches, continued.

1163. **Bettinger**, P. Détermination de la valeur des différents acides au point de vue de la liquéfaction de l'amidon. (Association des chimistes de sucrerie et de distillerie, Paris, 1919, tome 37, p. 126–131.) **VOA**

Experiments carried out on a plant scale show that the effectiveness of acids as starch liquefying agents decreases in the following order: hydrochloric, sulphuric, oxalic, tartaric and acetic.

Abstract in *Jour. soc. chem. ind.*, 1920, v. 39, p. 244A; *Chem. abst.*, 1920, v. 14, p. 1235; *Chem. Zentr.*, 1920, Bd. 2, p. 697.

1164. **Pomeranz**, H. Lösliche Stärke. (Auszug.) (Pharmazeutische Zentralhalle, Dresden und Leipzig, 1919, Jahrg. 60, p. 510.)

Available in Library of Columbia College of Pharmacy.

A soluble starch containing no reducing substance can be prepared by the action of 9–10% HCl in the cold. Starch treated with 1% HCl for 15 minutes is insoluble in cold water but soluble in hot. — *Chem. abst.*

1165. **Small**, James C. Method for the preparation of soluble starch. (American Chemical Society, Journal, Easton, 1919, v. 41, p. 113–120.) **PKA**

Studies method of preparing soluble starch by boiling with alcoholic HCl. Time of treatment, concentration of acid, and proportion of liquid to starch were varied. The soluble starch was determined as in *entry 1712*. Conditions are found which effect a complete conversion, the product showing no reaction for erythrodextrin and no cupric reducing power.

Abstract in *Chem. abst.*, 1919, v. 13, p. 521; *Chem. Zentr.*, 1919, Bd. 4, p. 47; *Chimie et industrie*, 1919, v. 2, p. 706.

1166. **Tanret**, Charles. Sur l'amidon soluble. (Société chimique de France, Bulletin, Paris, 1919, série 4, tome 5, p. 902–905.) **PKA**

1167. **Carey**, Cornelia L. A method of preparation and some properties of a starch gel. (Torrey Botanical Club, Bulletin, New York, 1920, v. 47, p. 455–463.)

Available in Library of Columbia University.

A stiff and fairly resistant starch gel is prepared by pouring thin layers of a suspension of 100 gr. of corn starch in 150 cc. H_2O into Petri dishes, and heating in an autoclave at 105–110° for 30 minutes. Strips of the gel dried at a low temperature swell considerably in H_2O, with very little loss by solution. — *Chem. abst.*

1168. **Parow**, Edmund. Die verschiedenen Herstellungsverfahren von löslicher Stärke. (Zeitschrift für Spiritusindustrie, Berlin, 1922, Jahrg. 45, p. 169.) **†† VTZA**

PRESERVATION OF STARCH SOLUTIONS

1169. **Mohr**, Otto. Ein haltbares Stärkepräparat zu Maassanalysen. (Annalen der Chemie und Pharmacie, Liebig's, Leipzig und Heidelberg, 1860, Bd. 115, p. 211–213.) **PKA**

The use of NaCl and $ZnCl_2$ is described.

Abstract in *Chem. Centr.*, 1860, p. 976; *Bull. soc. chim. Paris*, 1861, année 3, p. 61.

1170. **Hirschberg**, A. Gegen Schimmelbildung auf Gummilösungen. (Archiv der Pharmacie, Berlin, 1872, Bd. 200, p. 44–45.)

Available in Library of the Chemists' Club.

Mentions the use of mustard oil for preventing the souring of starch solutions.

1171. **Gastine**, G. Préparation de l'empois de fécule servant d'indicateur dans les analyses volumétriques par l'iode. (Société chimique de Paris, Bulletin, Paris, 1888, nouv. série, tome 50, semestre 2, p. 172–173.) **PKA**

Starch is ground with a small amount of red mercury iodide, moistened with water and poured into boiling water. The clear solution which is drawn off remains stable at least a year.

Abstract in *Jour. chem. soc.*, 1889, v. 56, p. 73; *Chem. Centr.*, 1888, p. 1240; *Zeit. anal. Chem.*, 1889, Jahrg. 28, p. 339.

1172. **Mutnianski**, M. Baryumthiosulfat sur Titerstellung der Lösungen in der Jodometrie, Alkalimetrie und Acidimetrie. (Zeitschrift für analytische Chemie, Wiesbaden, 1897, Jahrg. 36, p. 220–221.) **PKA**

Recommends the use of HgI_2 in the preparation of starch indicator solutions.

1173. **Seyda**, Anton. Kleinere analytische Mittheilungen. (Chemiker-Zeitung, Cöthen, 1898, Jahrg. 22, p. 1085–1086.) **†† VOA**

Includes directions for preparation of a zinc iodide starch solution.

1174. **Moerk**, Frank X. Starch indicator. (American journal of pharmacy, Philadelphia, 1904, v. 76, p. 476–477.)

Available in Library of the New York Academy of Medicine.

Oil of cassia is recommended as an effective preservative.

Abstract in *Chem. Centr.*, 1904, Bd. 2, p. 1756.

Starches and Dextrins, continued.

Preservation of Starch Solutions, continued.

1175. **Alcock,** F. N. Preservation of certain laboratory solutions. (Pharmaceutical journal, London, 1907, v. 79, p. 121–122.) **WTA**

Albumen and starch solutions may be successfully preserved for use by the addition of benzene in the proportion of 1 to 100. — *Chem. abst.*

1176. **Marsiglia,** T. Sulla ricerca dei nitrati nel vino e nel mosto. (Stazioni sperimentali agrarie italiane, Modena, 1908, v. 41, p. 162–170.)

Available in Library of the Department of Agriculture.

A starch-KI solution is used for detecting nitrates. The solution is prepared by dissolving starch in a $ZnCl_2$ solution and adding KI.

Abstract in *Jour. chem. soc.*, 1908, v. 94, part 2, p. 894; *Chem. Centr.*, 1908, Bd. 1, p. 2204.

1177. **Storm,** C. Potassium-iodide-starch paper. (Journal of industrial and engineering chemistry, Easton, 1909, v. 1, p. 802–803.) **VOA**

This paper, which is used in the heat or Abel test for stability of explosives, can be kept unaltered for 8 years.

Abstract in *Chem. abst.*, 1910, v. 4, p. 514; *Chem. Zentr.*, 1910, Bd. 1, p. 1806.

1178. **Storm.** Carta all'ioduro potassico e amido. (Abstract.) (Bollettino chimico-farmaceutico, Milano, 1914, v. 53, p. 736.)

Available in Library of the Chemists' Club.

Details of preparation of starch-KI paper.

Abstract in *Chem. abst.*, 1916, v. 10, p. 1970.

1179. **Held,** Dirk. Versuche und Gedanken über die konservierende Wirkung der Benzoesäure. (Archiv für Hygiene, München und Berlin, 1915, Bd. 84, p. 289–336.) **SPA**

Notes that in the presence of 2% benzoic acid, starch paste may be perfectly preserved for 2 months.

1180. **Ericsson,** Antipas. Hållbar stärkelselösning. (Svensk farmaceutisk tidskrift, Stockholm, 1916, v. 20, p. 499–500.)

Available in Library of the Chemists' Club.

If 5 gr. starch in 100 cc. water are heated to 80° for ten minutes and then set aside until next day, then filtered and 5 cc. N KOH added and the solution again heated, a starch solution will be obtained which keeps clear indefinitely. — *Chem. abst.*

1181. **Preparation** of a permanent starch solution. (Abstract.) (Chemical abstracts, Easton, 1917, v. 11, p. 2648.) **PKA**

Mercuric iodide is used.

1182. **Pollitz.** Haltbarkeit der Stärkelösungen. (Zeitschrift für angewandte Chemie, Leipzig, 1917, Jahrg. 30, Teil 1, p. 132.) **PKA**

The addition of a very small quantity of an alkali, e. g., NaOH, prevents the bacterial decomposition of starch solution, the quantity of alkali necessary is too small to have any influence when the starch solution is used as an indicator in iodometric titrations. — *Chem. abst.*

1183. **Hough,** George J. Some notes on paint analysis. (Journal of industrial and engineering chemistry, Easton, 1919, v. 11, p. 767–768.) **VOA**

Notes that a clear, stable solution of starch, which serves as a satisfactory indicator, can be prepared by dissolving potato starch in boiling 1% salicylic acid solution.

Abstract in *Chem. Zentr.*, 1920, Bd. 2, p. 693.

1184. **Junk,** A. Herstellung haltbarer Stärke- und Oxalsäurelösungen mit metallischem Quecksilber. (Chemiker-Zeitung, Cöthen, 1919, Jahrg. 43, p. 258.) **†† VOA**

The solution is treated with a few c.c. of Hg, boiled, shaken, and the Hg allowed to remain in the bottle. The growth of molds, etc., is thus prevented.

Abstract in *Chem. abst.*, 1920, v. 14, p. 36.

1185. **Miller,** R. J. Apparatus for rapid gastric analysis together with a method for the preservation of starch solution. (Journal of industrial and engineering chemistry, Easton, 1919, v. 11, p. 963–964.) **† VOA**

Starch solution kept in a reservoir under a layer of liquid petrolatum showed no deterioration over a period of 6 months.

Abstract in *Chem. Zentr.*, 1920, Bd. 4, p. 669.

1186. **Kano,** N. On the preservation of starch solution. [Title translated.] (Chemical Society of Japan, Journal, Tokyo, 1921, v. 42, no. 11.)

Available in Library of the Chemists' Club.

Alcohol, ether, acetone, camphor, toluene, phenol, chloroform, glycerol, napthalene, carbon disulphide and HCl were tried as preservatives for starch solution for use in iodometric titrations. The most satisfactory preservative is HCl (0.5 c.c. of 2N HCl to each 50 c.c. starch solution), when the titration is to be done in acid medium, and CS_2 (one drop to each 50 c.c.) when in neutral medium. — *Chem. abst.*

Starches and Dextrins, continued.

Preservation of Starch Solutions, continued.

1187. Painter, W. J. A starch indicator solution. (Analyst, London, 1922, v. 47, p. 166–167.) **PKA**

Rice starch is boiled with sodium carbonate solution, acidified with HCl, pieces of granulated zinc added and the mixture filtered. The filtered solution remained stable for 9 months.

Abstract in *Chem. Zentr.*, 1922, Bd. 4, p. 106.

PHYSICAL SECTION

GENERAL PHYSICAL CHARACTERISTICS

1188. Jessen, Carl. Über die Löslichkeit der Stärke. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1859, Bd. 106, p. 497–500.) **PAA**

When starch is ground with sand and water a solution is obtained which gives the characteristic blue coloration with iodine and a white precipitate with alcohol.

Abstract in *Bull. soc. chim. Paris*, 1859, tome 1, p. 432; *Jahresber. Chem.*, 1859, p. 544.

1189. Anthon, E. Friedr. Ueber die Löslichkeit des Stärkegummi's in Weingeist. (Dingler's polytechnisches Journal, Stuttgart und Augsburg, 1860, Bd. 155, p. 458–460.) **3–VA**

Abstract in *Wag. Jahr.*, 1860, Jahrg. 6, p. 336; *Chem. Centr.*, 1860, Jahrg. 5, p. 347–348.

1190. Jessen, Carl. Ueber die Löslichkeit der Stärke. 2. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1860, Bd. 109, p. 361–364.) **PAA**

Discusses recent paper of Wicke.

Abstract in *Chem. Centr.*, 1860, p. 367; *Jahresber. Chem.*, 1859, p. 545.

1191. Flueckiger, F. A. Ueber die Löslichkeit der Stärke. (Auszug.) (Zeitschrift für Chemie und Pharmacie, Erlangen, 1861, Jahrg. 4, p. 104–105.) **PKA**

Shows that pulverized starches from various sources are partially dissolved, especially in the presence of $CaCl_2$.

Also abstract in *Jahresber. Chem.*, 1860, p. 500.

1192. Graham, Thomas. Liquid diffusion applied to analysis. (Royal Society of London, Philosophical transactions, 1861, v. 151, part 1, p. 183–224.) ***EC**

On p. 215 notes that the rate of diffusion of starch dextrin is about 3 times that of gum arabic.

1193. Nossian, Wilhelm. Ueber das hygroskopische Verhalten mehrerer Stärkearten. (Journal für praktische Chemie, Leipzig, 1861, Bd. 83, p. 41–50.) **PKA**

Investigating 7 starches finds wheat starch is the least hygroscopic and acorn starch the most hygroscopic.

Abstract in *Chem. Centr.*, 1861, p. 815; *Jahresber. Chem.*, 1861, p. 714; *Wag. Jahr.*, 1861, Jahrg. 7, p. 358.

1194. Reinsch, Hugo. Verhalten des Stärkemehls beim Gefrieren und gegen das polarisirte Licht. (Auszug.) (Chemisches Central-Blatt, Leipzig, 1863, p. 351.) **PKA**

1195. Jessen, Carl. Ueber die Löslichkeit der Stärke. 3. (Annalen der Physik und Chemie, Poggendorff's, Leipzig, 1864, Bd. 122, p. 482–486.) **PAA**

1196. Flueckiger, F. A. Über das specifische Gewicht des Amylums. (Zeitschrift für analytische Chemie, Wiesbaden, 1866, Jahrg. 5, p. 302–306.) **PKA**

Determines specific weight of arrow-root and potato starches when dried in air and at 100°.

Abstract in *Wag. Jahr.*, 1867, Jahrg. 13, p. 421; *Jahresber. Chem.*, 1866, p. 664.

1197. Rother, S. Starch and albumin. (Pharmaceutical journal and transactions, London, 1872–73, series 3, v. 3, p. 644.) **WTA**

Evidence that albumen is held perfectly in aqueous solution at a boiling temperature if starch is present.

Abstract in *Jour. chem. soc.*, 1873, v. 26, p. 919; *Jahresber. Chem.*, 1873, Jahrg. 26, p. 828.

1198. Baily, Walter. Optical properties of starch. (Philosophical magazine, London, 1876, series 5, v. 2, p. 123–126.) **OA**

Abstract in *Jour. chem. soc.*, 1877, v. 31, p. 294; *Jahresber. Chem.*, 1876, p. 147.

1199. Berthelot. Fixation de l'azote sur les matières organiques et formation de l'ozone sous l'influence des faibles tensions électriques. (Annales de chimie et de physique, Paris, 1877, série 5, tome 12, p. 453–462.) **PAA**

Investigates fixation of nitrogen by dextrin under the influence of weak electric tensions.

1200. Bertin, A. Note sur les propriétés optiques des feuilles de gélatine. (Annales de chimie et de physique, Paris, 1878, série 5, tome 15, p. 129–132.) **PAA**

Notes that gum and dextrin exhibit positive double refraction.

Starches and Dextrins, continued.

General Physical Characteristics, continued.

1201. **Baily,** Walter. Starch and unannealed glass under the polariscope. (Philosophical magazine, London, 1879, series 5, v. 7, p. 39–50.) **OA**

Discussion, *ibid.*, p. 370–371.

1202. **Musculus,** Fritz. Sur les modifications des propriétés physiques de l'amidon. (Extrait.) (Académie des sciences, Comptes rendus, Paris, 1879, tome 88, p. 612–613.) ***EO**

Compares properties of starch in the crystalloidal and colloidal state.

Abstract in *Jour. chem. soc.*, 1879, v. 36, p. 518; *Chem. Centr.*, 1879, p. 325; *Wag. Jahr.*, 1879, Jahrg. 25, p. 686; *Jahresber. Chem.*, 1879, p. 835.

1203. An **Explosion** of starch. (Scientific American, New York, 1879, new series, v. 41, p. 151.) **†† VA**

Two explosions in candy factories are believed to be starch dust explosions.

1204. **Whewell,** G. Tenacity of starch. (Chemical news, London, 1879, v. 39, p. 97.) **PKA**

The tenacity is expressed as the inverse of the concentration of a starch paste which will support a known weight for a definite length of time. The tenacity of a sample varies in direct proportion to the stiffness which it will impart to cloth. This last statement is contradicted by Mr. William Thompson, *ibid.*, p. 122, to which the author replies, *ibid.*, p. 134.

Abstract in *Jour. chem. soc.*, 1879, v. 36, p. 570.

1205. **Rechenberg,** C. von. Ueber die Verbrennungswärme organischer Verbindungen. (Journal für praktische Chemie, Leipzig, 1880, N. F., Bd. 22, p. 1–45.) **PKA**

Notes that the heat of combustion of rice starch is 4448 calories per gr. Results for erythrodextrin were not conclusive.

Abstract in *Jour. chem. soc.*, 1881, v. 40, p. 135–136; *Chem. Centr.*, 1880, p. 514–515.

1206. **Spring,** Walthère. Recherches sur la propriété que possedent les corps de se souder sous l'action de la pression. (Annales de chimie et de physique, Paris, 1881, série 5, tome 22, p. 170–217.) **PAA**

On p. 199 notes that starch, when submitted to a pressure of 6,000 atmospheres, coalesces into a block which, in some respects, simulates the properties of porcelain. All traces of the granular structure are destroyed.

1207. **Wiedemann,** E., and Ch. Lüdeking. Über die Wärmeentwickelung bei der Quellung und Lösung der Colloide. (Annalen der Physik und Chemie, Leipzig, 1885, N. F., Bd. 25, p. 145–153.) **PAA**

Results for starch and dextrin are given on p. 150.

Abstract in *Jahresber. Chem.*, 1885, p. 113–114.

1208. **Berthelot,** and Vieille. Chaleur de combustion et de formation des sucres, hydrates de carbone et alcools polyatomiques congénères. (Académie des sciences, Comptes rendus, Paris, 1886, tome 102, p. 1284–1286.) ***EO**

Note that the heats of combustion of starch and dextrin are 684.9 and 667.2 calories per gram, respectively, and that the heats of formation are 224 and 241, respectively.

Reprinted in *Bull. soc. chim. Paris*, 1887, nouv. série, tome 47, semestre 1, p. 867–870.

Reprinted in further detail in *Annales de chimie et de physique*, 1887, série 6, tome 10, p. 455–463, *PAA*.

1209. **Meissner,** Franz. Ueber die beim Benetzen pulverförmiger Körper auftretende Wärmetönung. (Annalen der Physik und Chemie, Leipzig, 1886, N. F., Bd. 29, p. 114–131.) **PAA**

Wheat starch is included among substances investigated.

Abstract in *Jour. chem. soc.*, 1887, v. 52, p. 9; *Jahresber. Chem.*, 1886, p. 206.

1210. **Hartley,** W. N. Spectroscopic notes on the carbohydrates and albuminoids from grain. (Chemical Society of London, Journal, 1887, v. 51, p. 58–61.) **PKA**

Notes that starch and diastase in dilute solutions are highly diactinic and show no absorption-bands.

Abstract in *Ber.*, 1887, Jahrg. 20, R, p. 174; *Jahresber. Chem.*, 1887, p. 350.

1211. **Mallet,** J. W. On a partial separation of the constituents of a solution during expansion by rise of temperature. (Chemical news, London, 1887, v. 56, p. 146–147.) **PKA**

A carefully filtered starch solution was cooled to 0°, the temperature was then raised gradually and it was noted that starch was not present in the upper portions of the expanding liquid. Other colloid substances behaved similarly.

1212. **Luedeking,** Ch. Ueber das physikalische Verhalten von Lösungen der Colloide. (Annalen der Physik und Chemie, Leipzig, 1888, N. F., Bd. 35, p. 552–557.) **PAA**

Notes effect of starch and dextrin on the boiling point of their solutions.

1213. **Ullik,** F. Über die Wasserbindung der Malztrockensubstanz. (Zeitschrift für

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General Physical Characteristics, continued.

das gesammte Brauwesen, München und Leipzig, 1891, Jahrg. 14, p. 565–577.)

Available in Library of the Chemists' Club.

Studies affinity of potato starch for water and the rise in temperature which accompanies this combination.

Abstract in *Jour. soc. chem. ind.*, 1893, v. 12, p. 281; *Chem. Centr.*, 1892, Bd. 1, p. 250.

1214. **Linebarger,** C. E. Molecular masses of dextrin and gum arabic as determined by their osmotic pressures. (American journal of science, New Haven, 1892, series 3, v. 43, p. 426–428.) **OA**

Calculations are made from Pfeffer's observations of osmotic pressures. The molecular weight of dextrin corresponds to approximately 7 glucose residues.

1215. **Picton,** Harold, and S. Ernest Linder. Solution and pseudo-solution. (Chemical Society of London, Journal, 1892, v. 61, p. 148–172.) **PKA**

p. 156. Starch solutions, prepared bv Zulkowski's method, were found to polarize light, to exhibit the Tyndall phenomena and to be practically non-diffusable.

1216. **Stohmann,** F., and H. Langbein. Ueber den Wärmewerth von Kohlehydraten, mehrsäurigen Alkoholen und Phenolen. (Journal für praktische Chemie, Leipzig, 1892, N. F., Bd. 45, p. 305–356.) **PKA**

Determine heat of combustion of starch and other carbohydrates at constant temperature and at constant pressure.

1217. **Béchamp,** Auguste. Sur la cause de la variation du pouvoir rotatoire dans certaines dissolutions de corps optiquement actifs, avec le temps et avec la dilution, et sur le pouvoir rotatoire des substances actuellement amorphes. (Société chimique de Paris, Bulletin, Paris, 1893, série 3, tome 9, p. 511–529.) **PKA**

Includes study of rotatory power of various starch modifications.

1218. **Rodewald,** Hermann. Über die Quellung der Stärke. (Landwirtschaftlichen Versuchs-Stationen, Berlin, 1894, Bd. 45, p. 201–227.)

Available in Library of the Department of Agriculture.

Using wheat starch, both dry and steeped (gequollen), determines specific gravity, specific heat, and heat of steeping (quellung). Discusses effect of temperature on steeping heat and amount of water absorbed. Also discusses relation of pressure to decrease of volume in steeping.

Abstract in *Jour. chem. soc.*, 1895, v. 68, part 1, p. 165; *Chem. Centr.*, 1895, Bd. 1, p. 76; *Jahresber. Chem.*, 1894, p. 1137.

1219. **Beijerinck,** Martinus W. Über eine Eigentümlichkeit der löslichen Stärke. (Centralblatt für Bakteriologie, Jena, 1896, Abt. 2, Bd. 2, p. 697–699.) **QDA**

Investigates a peculiar physical relation of starch and gelatine solutions.

Abstract in *Jour. chem. soc.*, 1897, v. 72, part 1, p. 548; *Chem. Centr.*, 1897, Bd. 1, p. 283.

1220. **Glan,** Paul. Theoretische Untersuchungen über elastische Körper und Licht. (Annalen der Physik und Chemie, Leipzig, 1896, N. F., Bd. 59, p. 155–179.) **PAA**

Starch observations on p. 173.

1221. **Brown,** Horace T., and others. Specific rotation of maltose and of soluble starch. By H. T. Brown, G. Harris Morris and J. H. Millar. (Chemical Society of London, Journal, 1897, v. 71, p. 109–114.) **PKA**

The specific rotatory power of soluble starch, prepared by Lintner's method, is $\alpha_D=$ 202°.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 166; *Chem. Centr.*, 1897, Bd. 1, p. 366; *Bull. assoc. chimistes*, 1896–97, tome 14, p. 1198.

1222. **Rodewald,** Hermann. Thermodynamik der Quellung mit specieller Anwendung auf die Stärke und deren Molekulargewichtsbestimmung. (Zeitschrift für physikalische Chemie, Leipzig, 1897, Bd. 24, p. 193–218.) **PKA**

The term "Quellung" is applied to the absorption of water, or other liquid, by a solid substance which does not exhibit any pores, visible or microscopic. An expression is deduced thermodynamically for the heat liberated in terms of the change of specific volume. Records experimental work for the case of starch.

Abstract in *Jour. chem. soc.*, 1898, v. 74, part 2, p. 61; *Chem. Centr.*, 1897, Bd. 2, p. 1068; *Bull. soc. chim. Paris*, 1898, série 3, tome 20, p. 4.

1223. **Friedenthal,** Hans. Das Molekulargewicht der löslichen Stärke. (Centralblatt für Physiologie, Leipzig und Wien, 1898–99, Bd. 12, p. 849–850.)

Available in Library of the New York Academy of Medicine.

A commercial soluble starch known as "ozone" starch was dissolved in water and precipitated with alcohol; the molecular weight of the product was 9450 as determined by method of Beckmann.

Abstract in *Jour. chem. soc.*, 1899, v. 76, part 1, p. 851; *Chem. Centr.*, 1899, Bd. 1, p. 924.

Starches and Dextrins, continued.

General Physical Characteristics, continued.

1224. **Ott,** Emma. Einige Beobachtungen über die Brechungsexponent verschiedener Stärkesorten. (Österreichische botanische Zeitschrift, Wien, 1899, Jahrg. 49, p. 313–317.)

Available in Library of the Department of Agriculture.

Abstract in *Wag. Jahr.*, 1899, Jahrg. 45, p. 724.

1225. **Bruyn,** C. A. Lobry de. Quelques remarques sur la grandeur des particles, présentes dans les solutions colloïdales ou pseudo-solutions. (Recueil des travaux chimiques des Pays-Bas, Leide, 1900, tome 19, p. 251–258.) **PKA**

Concludes that the starch molecule has a diameter of 5μμ as compared with 0.66μμ for a chlorine molecule. Suggests that the molecular weight of starch is of much lower magnitude than usually assumed.

Abstract in *Jour. chem. soc.*, 1901, v. 80, part 2, p. 90; *Chem. Centr.*, 1901, Bd. 1, p. 160.

1226. **Rodewald,** Hermann, and A. Kattein. Die spezifische Wärme der Weizenstärke als Funktion ihres Wassergehaltes und der Temperatur. (Zeitschrift für physikalische Chemie, Leipzig, 1900, Bd. 33, p. 540–544.) **PKA**

Determine specific heats of wheat starch containing zero to 33.6% water. The values at zero vary from 0.2697 to 0.3054, although the variation is not uniform.

Abstract in *Jour. chem. soc.*, 1900, v. 78, part 1, p. 477; *Chem. Centr.*, 1900, Bd. 2, p. 180.

1227. **Rodewald,** Hermann. Über Quellungs- und Benetzungserscheinungen. (Zeitschrift für physikalische Chemie, Leipzig, 1900, Bd. 33, p. 593–604.) **PKA**

Deduces a mathematical expression for the heat of wetting (quellung) of starch. A calculation of the surface areas of starch molecules and of the surrounding water molecules indicates that the molecular weight of starch is 17,000 to 103,000.

Abstract in *Jour. chem. soc.*, 1900, v. 78, part 1, p. 477; *Chem. Centr.*, 1900, Bd. 1, p. 180.

1228. **Zsigmondy,** Richard. Die hochrothe Goldlösung als Reagens auf Colloide. (Zeitschrift für analytische Chemie, Wiesbaden, 1901, Jahrg. 40, p. 697–719.) **PKA**

Colloidal gold solutions are agglomerated upon addition of an electrolyte, the color changing from red to blue. The weight in mg. of a colloid required to prevent this color change is termed its "gold number." Relatively large amounts of dextrin and potato starch are required.

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 2, p. 188; *Bull. soc. chim. Paris*, 1902, série 3, tome 28, p. 200–201.

1229. **Quincke,** G. Die Oberflächenspannung an der Grenze wässeriger Kolloidlösungen von verschiedener Konzentration. (Annalen der Physik, Leipzig, 1903, Folge 4, Bd. 10, p. 673–703.) **PAA**

1230. —— Niederschlagmembranen und Zellen in Gallerten oder Lösungen von Leim, Eiweiss und Stärke. (Annalen der Physik, Leipzig, 1903, Folge 4, Bd. 11, p. 449–488.) **PAA**

1231. **Raehlmann,** E. Über ultramikroskopische Untersuchung von Lösungen der Albuminsubstanzen und Kohlehydrate und eine neue optische Methode der Eiweissbestimmung bei Albuminurie. (Münchener medizinische Wochenschrift, München, 1903, Jahrg. 50, p. 2089–2090.)

Available in Library of the New York Academy of Medicine.

Dextrin and diastase are included.

Abstract in *Chem. Centr.*, 1904, Bd. 1, p. 321.

1232. **Voit,** Erwin. Die Berechnung der Verbrennungswärme mittels der Elementarzusammensetzung. (Zeitschrift für Biologie, München und Berlin, 1903, Bd. 44, p. 345–361.) **QAA**

Starch is included among compounds investigated.

Abstract in *Chem. Centr.*, 1903, Bd. 1, p. 894.

1233. **Brown,** Horace T. Specifische Gewicht der Stärke. (Auszug.) (Jahres-Bericht der chemischen Technologie, Wagner's, Leipzig, 1904, Jahrg. 50, p. 222.) **VOA**

1234. **Mueller,** Arthur. Über Suspensionen in Medien von hoher innerer Reibung. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1904, Jahrg. 37, p. 11–16.) **PKA**

Determines relation between viscosity and "gold number" for several substances, including potato starch, wheat starch, and dextrin.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 2, p. 160; *Chem. Centr.*, 1904, Bd. 1, p. 525.

1235. **Šebor,** Joh. Diffusionsgeschwindigkeit von Wasser durch eine halbdurchlässige Membran. (Zeitschrift für Elektrochemie, Halle, 1904, Jahrg. 10, p. 347–353.) **PKA**

Describes a cell in which the rate of diffusion is proportional to the osmotic pressure. By this method the molecular weight of dextrin is approximately 1032.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 2, p. 540; *Chem. Centr.*, 1904, Bd. 2, p. 74.

1236. **Hoffmann,** J. F., and M. Philippe. Über die Quellungswärme der Stärke und

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des Malzschrots. (Wochenschrift für Brauerei, Berlin, 1905, Jahrg. 22, p. 71–72.) **VTRA**

The evolution of heat is attributed to pressures produced by the penetration of water into the capillary orifices of the granules. Capillary attraction is diminished when the temperature is increased.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 204; *Chem. Centr.*, 1905, Bd. 1, p. 1118.

1237. Guaidukov, N. Ultramikroskopische Untersuchungen der Stärkekörner, Zellmembranen und Protoplasm. (Deutsche botanische Gesellschaft, Berichte, Berlin, 1906, Jahrg. 24, p. 581–590.) **QEA**

Abstract in *Chem. Centr.*, 1907, Bd. 1, p. 643.

1238. Bechhold, H. Kolloidstudien mit der Filtrationsmethode. (Zeitschrift für physikalische Chemie, Leipzig, 1907, Bd. 60, p. 257–318.) **PKA**

Various colloids, including dextrin, are separated from solution by filtration under pressure. The molecular weight of dextrin is approximately 965.

Abstract in *Chem. abst.*, 1907, v. 1, p. 2762; *Chem. Centr.*, 1907, Bd. 2, p. 1374.

1239. Parow, Edmund. Das spezifische Gewicht verschiedener Stärkearten. (Zeitschrift für Spiritusindustrie, Berlin, 1907, N. F., Jahrg. 30, p. 432.) **†† VTZA**

Has determined specific gravity of potato, wheat, maize and rice starch in both water and toluene.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 1103; *Jahresber. Chem.*, 1905–08, Bd. 2, p. 932; *Wag. Jahr.*, 1907, Bd. 2, p. 217; *Chem. Centr.*, 1907, Bd. 2, p. 1606.

1240. Cross, Charles F., and E. J. Bevan. Das Molekular- und das Lösungsvolumen von kolloidalen Kohlehydraten. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1909, Jahrg. 42, p. 2198–2204.) **PKA**

The molecular solution volume of starch indicates a similarity to certain cyclic carbohydrates.

Abstract in *Jour. chem. soc.*, 1909, v. 96, part 1, p. 555; *Chem. abst.*, 1909, v. 3, p. 2454; *Jour. soc. chem. ind.*, 1909, v. 28, p. 806; *Chem. Zentr.*, 1909, Bd. 2, p. 424.

1241. Fischer, H. W., and O. Bobertag. Über das Ausfrieren von Gelen. (Biochemische Zeitschrift, Berlin, 1909, Bd. 18, p. 58–94.) **PPB**

Tubes containing water and hydrogels are placed in low temperature baths and the thermal effects observed. Starch is included among substances studied.

Abstract in *Jour. chem. soc.*, 1909, v. 96, part 2, p. 545; *Chem. Centr.*, 1909, Bd. 2, p. 495.

1242. Koenig, F. Josef, and J. Hasenbäumer. Über die Bestimmung des osmotischen Druckes. (Zeitschrift für angewandte Chemie, Leipzig, 1909, Jahrg. 22, p. 1009–1018, 1070–1074.) **PKA**

Includes osmotic pressure determinations for achroo- and erythrodextrins.

Abstract in *Jour. chem. soc.*, 1909, v. 96, part 2, p. 555; *Bull. soc. chim. France*, 1909, série 4, tome 6, p. 1137.

1243. Oholm, L. William. Die freie Diffusion der Nichtelektrolyte. 1. Über die Hydrodiffusion einiger optisch-aktiven Substanzen. (Zeitschrift für physikalische Chemie, Leipzig, 1910, Bd. 70, Arrhenius-Festband, 2, p. 378–407.) **PKA**

Determines diffusion coefficient at 20° for a number of substances including dextrin. The calculated molecular weight of dextrin by these observations is 4440.

Abstract in *Chem. abst.*, 1910, v. 4, p. 1125; *Chem. Zentr.*, 1910, Bd. 1, p. 1317.

1244. Walden, P. Formamid als Lösungs- und Jonisierungsmittel. (Académie impériale des sciences de St.-Pétersbourg, Bulletin, 1911, tome 5, p. 1055–1082.) *** QCB**

Specially purified starch was found to have an average molecular weight of 645 by freezing point depression in formamide solution.

1245. Frank, Jos. Untersuchungen über einige physikalische Eigenschaften kolloider Lösungen. 1. Volumänderung bei der Wasseraufnahme, bezw. Lösung von Kolloiden. (Kolloidchemische Beihefte, Dresden and Leipzig, 1912–13, Bd. 4, p. 195–228.) **PKA**

On p. 202–203 gives determination of contraction coefficient for starch.

1246. Marc, R. Über die Bestimmung der Konzentration kolloidaler Lösungen mittels des neuen Flüssigkeitsinterferometers. (Chemiker-Zeitung, Cöthen, 1912, Jahrg. 36, p. 537–540.) **VOA**

Includes observations on dextrin and soluble starch.

Abstract in *Jour. chem. soc.*, 1912, v. 102, part 2, p. 745.

1247. Biltz, Wilhelm, and Wilhelm Truthe. Über den osmotischen Druck der Kolloide. 5. Zur Kolloidchemie der Dextrine. (Zeitschrift für physikalische Chemie, Leipzig, 1913, Bd. 83, p. 683–707.) **PKA**

By osmotic pressure methods determine molecular weight of a number of starch dextrins; results range from 22,200 for amylodextrin to 1,200 for achroodextrin II. The protective action of dextrins on colloidal gold solutions was found to be inversely proportional to the molecular weight. The

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molecular weight was further shown to bear a relation to the viscosity of the solutions and to the adsorption of the dextrins by a hydrogel of $Fe(OH)_3$.

Abstract in *Chem. abst.*, 1913, v. 7, p. 3883; *Chem. Zentr.*, 1913, Bd. 2, p. 1013; *Bull. soc. chim. France*, 1913, série 4, tome 14, p. 1060.

1248. —— Über die Molekulargrösse von Dextrin β. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1913, Jahrg. 46, p. 1377–1380.) **PKA**

By osmotic pressure determinations, the molecular weight of Pringsheim and Langhan's dextrin β is shown to be approximately 950.

Abstract in *Chem. abst.*, 1913, v. 7, p. 2574; *Bull. soc. chim. France*, 1913, série 4, tome 14, p. 1021.

1249. Findlay, Alexander, and George King. Rate of evolution of gases from supersaturated solutions. 1. Influence of colloids and of suspensions of charcoal on the evolution of carbon dioxide. (Chemical Society of London, Journal, 1913, v. 103, part 1, p. 1170–1193.) **PKA**

Starch and dextrins are included among substances investigated.

Abstract in *Chem. Zentr.*, 1913, Bd. 2, p. 1095.

1250. Gaudechon, H. Relation entre l'effet thermique qui accompagne l'immersion des corps pulvérents secs dans les corps liquides et l'aptitude de ces derniers à former des molécules associées. (Académie des sciences, Comptes rendus, Paris, 1913, tome 157, p. 209–211.) ***EO**

Includes a determination of heat evolved when dried starch is introduced into 16 different liquids.

Abstract in *Chem. Zentr.*, 1913, Bd. 2, p. 1113.

1251. Gutbier, A., and Eduard Weingärtner. Studien über Schutzkolloide. 1. Stärke als Schutzkolloid. (Kolloidchemische Beihefte, Dresden und Leipzig, 1913–14, Bd. 5, p. 211–268.) **PKA**

Study influence of starch as a protective colloid for silver and gold sols. Note that alkalis accelerate the reducing action of starch.

Abstract in *Chem. abst.*, 1914, v. 8, p. 1225; *Chem. Zentr.*, 1914, Bd. 1, p. 1333.

1252. Jackson, J. Explosion at the dextrin works of Messrs. J. Laing, Son & Co., Holt Town, Manchester, March 11, 1913. (Society of Chemical Industry, Journal, London, 1913, v. 32, p. 1080.) **VOA**

Gives cause of explosion and details precautions. Samples of dust (starch, flour, dextrin) show minimum ignition temperatures of 520–650°. All the samples, present as a cloud in air, were capable of propagating a flame rapidly.

Duplicate in *Chem. abst.*, 1914, v. 8, p. 1209.

1253. Oholm, L. William. Die freie Diffusion der Nichtelektrolyte. 2. Über die Hydrodiffusion einiger organischer Substanzen. (Auszug.) (Chemisches Zentral-Blatt, Berlin, 1913, Bd. 1, p. 1649.) **PKA**

Concentrations were measured by means of a Pulfrich refractometer. From the data obtained, the calculated molecular weight of starch, in paste form, is 970 and, in powder form, 10,000.

Also abstracted in *Chem. abst.*, 1913, v. 7, p. 2506.

1254. Wheeler, R. V. Inflammability of carbonaceous factory dusts. (Engineering, London, 1913, v. 95, p. 606–607.) **†† VDA**

Of 66 substances examined, the order of decreasing inflammability is sugar, dextrin (calcined farina), starch, cocoa, etc.

Abstract in *Chem. abst.*, 1913, v. 7, p. 2686.

1255. Berczeller, L. Stalagmometrische Studien an krystalloiden und kolloiden Lösungen. 8. Über einige Komplexe von Eiweiss und Stärke mit anderen Kolloiden. (Biochemische Zeitschrift, Berlin, 1914, Bd. 66, p. 207–217.) **PPB**

Soaps cause a greater lowering of surface tension in pure water than in starch solutions. The combination of starch and soap is influenced by the period of action and by the nature of the starch.

Abstract in *Bull. soc. chim. France*, 1916, série 4, tome 20, p. 441.

1256. Findlay, Alexander, and George King. Rate of evolution of gases from supersaturated solutions. 2. Carbon dioxide in solutions of gelatin and starch. (Chemical Society of London, Journal, 1914, v. 105, p. 1297–1305.) **PKA**

Investigate effect of boiling and of the rate of cooling on the rate of escape of CO_2 from solutions of starch.

Abstract in *Chem. Zentr.*, 1914, Bd. 2, p. 469; *Bull. soc. chim. France*, 1914, série 4, tome 16, p. 875.

1257. Gróh, Julius. Über die Messung der Schutzwirkung von Schutzkolloiden. (Zeitschrift für physikalische Chemie, 1914, Leipzig and Berlin, Bd. 88, p. 414–418.) **PKA**

Determines action of various colloids in retarding the decomposition of H_2O_2 by colloidal Pt. Dextrin is included among substances investigated.

Abstract in *Chem. abst.*, 1915, v. 9, p. 7; *Chem. Zentr.*, 1914, Bd. 2, p. 1295.

1258. Grosvenor, William M. A peculiar dust explosion. (Society of Chemical Industry, Journal, 1914, v. 33, p. 60–63.) **VOA**

Gives results of experiments with starch dust and describes an "explosion" which

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occurred during the cleaning of a starch drying chamber; discusses nature of "starch explosions".

Abstract in *Chem. abst.*, 1914, v. 8, p. 1347; *Chem. Zentr.*, 1914, Bd. 1, p. 925.

1259. **Lewis,** W. K. The solubility of dextrin. (Journal of industrial and engineering chemistry, Easton, 1914, v. 6, p. 308–309.) **VOA**

Samples of dextrin are agitated with water and the undissolved fraction separated by centrifuging. The soluble fraction increases rapidly with dilution.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 495; *Chem. Zentr.*, 1914, Bd. 1, p. 1883.

1260. **Smith,** George McP. The ideal diffusion coefficient and a fundamental law concerning the diffusion of dissolved substances in liquids. (American Chemical Society, Journal, Easton, 1914, v. 36, p. 847–864.) **PKA**

Notes that the indicated molecular weight of dextrin is 4815.

Abstract in *Chem. Zentr.*, 1914, Bd. 2, p. 911.

1261. **Beijerinck,** Martinus W. Crystallised starch. (Koninklijke Akademie van Wetenschappen, Proceedings, Amsterdam, 1915, v. 18, p. 305–309.) ***EL**

The characteristic deposits formed upon cooling solutions of certain starches indicate that the deposits are crystalline.

Abstract in *Jour. chem. soc.*, 1915, v. 108, part 1, p. 940.

1262. **Findlay,** Alexander, and O. R. Howell. Solubility of carbon dioxide in water in the presence of starch. (Chemical Society of London, Journal, 1915, v. 107, p. 282–284.) **PKA**

Determine solubility in 5% starch solutions prepared by 4 different methods.

Abstract in *Chem. Zentr.*, 1915, Bd. 1, p. 1201; *Chem. abst.*, 1915, v. 9, p. 1572.

1263. **Brown,** H. H. Inflammability of carbonaceous dusts. (Journal of industrial and engineering chemistry, Easton, 1917, v. 9, p. 269–275.) **VOA**

Uses an apparatus designed by the U. S. Bureau of Mines for testing coal dust; a large number of dusts are tested, including those of various starches and dextrins.

Abstract in *Jour. soc. chem. ind.*, 1917, v. 36, p. 471.

1264. **Dehn,** William M. Comparative solubilities in water, in pyridine and in aqueous pyridine. (American Chemical Society, Journal, Easton, 1917, v. 39, p. 1399–1404.) **PKA**

Notes that at 20–25° 65 gr. dextrin are soluble in 100 gr. pyridine and that 102 gr. dextrin are soluble in 100 gr. aqueous pyridine.

Abstract in *Chem. Zentr.*, 1918, Bd. 1, p. 49, 50.

1265. **Hofmann,** F. B. Über das Haften von Stärke an Flüssigkeitsgrenzen. 1. Versuche an Stärkekörnern. (Archiv für die gesamte Physiologie des Menschen und der Tiere, Pflüger's, Bonn, 1917, Bd. 167, p. 267–279.) **QCA**

Potato starch has been used to study the adhesion of solids when distributed between two immiscible liquids and the conditions which influence this adhesion. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1917, Bd. 2, p. 230.

1266. **Stockham,** W. L. The capacity of wheat and mill products for moisture. (North Dakota. — Agricultural Experiment Station, Bulletin, Agricultural College, N. D., 1917, no. 120, p. 97–131.) **VPG**

Notes that the starch prepared from patent flour has a greater moisture capacity than that prepared from clear flour. Also, that the moisture capacity of starch is doubled by hydrolysis, whereas by dextrinization it is decreased. Shows relation of these facts to behavior of bread.

Abstract in *Chem. abst.*, 1917, v. 11, p. 3064.

1267. **Walter,** F. C. Zur Kenntnis der Bierdextrine. (Zeitschrift für das gesammte Brauwesen, München, 1917, Jahrg. 40, p. 137–138, 145–147, 153–155, 161–164, 169–172.)

Available in Library of the Department of Agriculture.

The specific rotations, viscosities and molecular weights correspond to those of the lower achroodextrins.

Abstract in *Chem. abst.*, 1918, v. 12, p. 400.

1268. **Scherrer,** P. Bestimmung der Grösse und der inneren Struktur von Kolloidteilchen mittels Röntgenstrahlen. (Gesellschaft der Wissenschaften zu Göttingen, Nachrichten, Mathematisch-physikalische Classe, Berlin, 1918, p. 98–100.) ***EE**

By the method of Debye and Scherrer, starch and other organic colloids appear to be amorphous. The colloid particles probably consist of individual molecules or of groups of irregularly orientated molecules.

Abstract in *Chem. abst.*, 1919, v. 13, p. 2624; *Chem. Zentr.*, 1919, Bd. 1, p. 322.

1269. **Sollmann,** Torald. Water-absorbing capacity of dusting powders. (American

Starches and Dextrins, continued.

General Physical Characteristics, continued.

Medical Association, Journal, Chicago, 1919, v. 72, p. 935–936.) † **WAA**

Tests proved that dusting powders retained water, expressed as a percent of the weight of the powder, as follows: corn starch 80, kaolin 73, fuller's earth 70, precipitated $CaCO_3$ 65, talcum 61, and prepared chalk 53. — *Chem. abst.*

1270. **Herzog,** R. O., and Willi Jancke. Über den physikalischen Aufbau einiger hochmolecularer organischer Verbindungen. (1. Vorläufige Mitteilung.) (Deutsche chemische Gesellschaft, Berichte, Berlin, 1920, Jahrg. 53, p. 2162–2164.) **PKA**

Using the Röntgen-spectrographic nethod of Debye and Scherrer, note that ice, maize and wheat starches show idenical interference bands corresponding to he rhombic system of crystals and the xial ratio 0.7252:1:0.5509.

Abstract in *Chem. abst.*, 1921, v. 15, p. 1311.

271. **Padoa,** M. Studî sui colori specifici. Reale accademia nazionale dei Lincei, At- i, Roma, 1920, serie 5, v. 29, semestre 2, p. 98–202.) * **ER**

Notes that the specific heat of laevoglu- osan is .608 and that of potato and rice tarches is .303 and .308 respectively. That diminution of specific heat should accom- any polymerization is in line with other easurements.

Reprinted in *Gazzetta chimica italiana*, 1920, v. , parte 2, p. 312–317.

Abstract in *Chem. abst.*, 1921, v. 15, p. 1844; *hem. Zentr.*, 1921, Bd. 3, p. 588; *Bull. soc. chim. rance*, 1921, série 4, tome 30, p. 547.

272. **Bradford,** Samuel C. On the theory gels. 3. (Biochemical journal, Cam- ridge, 1921, v. 15, p. 553–562.) **PPB**

Notes that starch gels have a granular ructure like that of a pile of shot.

Abstract in *Bull. soc. chim. France*, 1922, série 4, ne 32, p. 215.

73. **Clayton,** W. Die Koagulation an- ganischer Suspensoide durch Emulsoide. Colloid-Zeitschrift, Dresden and Leipzig, 21, Bd. 28, p. 233–235.) **PKA**

Describes the precipitation of an inor- nic solid suspensoid by a small proportion starch. An alkali starch has a greater ecipitating power.

Abstract in *Chem. abst.*, 1921, v. 15, p. 2571.

74. **Findlay,** Alexander, and William omas. Influence of colloids on the rate reactions involving gases. 1. Decomposi- n of hydroxylamine in the presence of loidal platinum. (Chemical Society of London, Journal, 1921, v. 119, part 1, p. 170–176.) **PKA**

The decomposition is retarded by dextrin, soluble starch and other colloids.

1275. **Heesch,** Karl. Untersuchungen über die Umladbarkeit von Zellen, Zellbestandteilen und Membranen. (Archiv für die gesamte Physiologie, Pflüger's, Berlin, 1921, Bd. 190, p. 198–211.) **QCA**

Negatively charged wheat starch granules suspended in a sucrose-NaCl solution undergo a reversal of charge when a certain concentration of La ions is reached. The presence of various organic colloids tends to alter the effect of the La ions.

Abstract in *Chem. abst.*, 1922, v. 16, p. 2522; *Chem. Zentr.*, 1922, Bd. 1, p. 642.

1276. **Herzog,** R. O., and Willi Jancke. Röntgenspektrographische Beobachtungen an hochmolekularen organischen Verbindungen. (Naturwissenschaften, Berlin, 1921, Jahrg. 9, p. 320–321.) **OA**

Note that amylodextrin is crystalline whereas starch acetate is amorphous.

1277. —— Der Molekularbau der Faserstoffe. (Umschau, Frankfurt, 1921, Jahrg. 25, p. 53–54.) **OA**

Note that starch possesses a crystalline form.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 573.

1278. **Leathes,** J. B. Molecular size and range of molecular attractions in solutions. (Nature, London, 1921, v. 107, p. 138–139.) **OA**

The radius of the molecules of starch and many proteins must be of the nature of 50 Å, which is also the value commonly assigned to the radius of sphere of molecular attraction. From this standpoint surface behavior and the difference in behavior of colloidal and ordinary solutions are discussed. — *Chem. abst.*

1279. **Browne,** C. A. Moisture absorptive power of different sugars and carbohydrates under varying conditions of atmospheric humidity. (Journal of industrial and engineering chemistry, Easton, 1922, v. 14, p. 712–714.) † **VOA**

Seventeen carbohydrates, previously dried over P_2O_5 in a vacuum desiccator, were exposed to a moist atmosphere at various temperatures and degrees of saturation and the rate of absorption of water measured. Notes that at 20° C and 60% relative humidity, starch shows the greatest absorption for the first hour. The moisture is absorbed with so much avidity that heat is evolved.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3227; *Chem. Zentr.*, 1922, Bd. 3, p. 959; 1923, Bd. 3, p. 120.

Starches and Dextrins, continued.

General Physical Characteristics, continued.

1280. **Clark**, George L., and William A. Mann. A quantitative study of the adsorption in solution and at interfaces of sugars, dextrin, starch, gum arabic, and egg albumin, and the mechanism of their action as emulsifying agents. (Journal of biological chemistry, Baltimore, 1922, v. 52, p. 157–182.) **PPB**

Using 5 substances which are recognized as emulsifying agents, determine viscosity, density, surface tension, and interfacial tension between solution and benzene. Surface tensions and interfacial tensions of dextrin and starch show close similarities, although there are some differences when electrolytes are present. Surface tensions and interfacial tensions of the two are lowered by most electrolytes, especially by NaOH. Dextrin is found to be a better emulsifying agent than starch.

Abstract in *Chem. abst.*, 1922, v. 16, p. 2432; *Chem. Zentr.*, 1922, Bd. 3, p. 1109–1110; *Bull. soc. chim. France*, 1922, série 4, tome 32, p. 2174.

1281. **Lewis**, S. J. The quantitative determination of the fluorescent powers (the spectro fluorescometry) of cellulose, sugars and other substances. (Society of Dyers and Colourists, Journal, Bradford, 1922, v. 38, p. 68–76, 99–108.) **† VLG**

Describes a new method of spectrofluorescometry, which is capable of a precision of 1 per cent relative to the fluorescence of cellulose. Studies fluorescence curves of soluble starch, maize starch, potato starch, and dextrin. Soluble starch and maize starch exhibit remarkable distortions at λ 2,460.

Abstract in *Chem. abst.*, 1922, v. 16, p. 2807.

1282. **Sponsler**, O. L. The structure of the starch grain. (American journal of botany, Lancaster, Pa., 1922, v. 9, p. 471–492.) **QEA**

X-ray photographs show that there is a regular and fairly uniform arrangement of atoms in the starch grain. This regularity is destroyed when the grain is crushed indicating that the regularity is not that of crystal structure.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1822.

1283. —— Structural units of starch determined by X-ray crystal structure method. (Journal of general physiology, New York, 1922–23, v. 5, p. 757–776.)

Available in Library of the New York Academy of Medicine.

A regular arrangement of the planes of starch atoms is indicated by the lines of X-ray spectrum negatives. Their position is explained on the supposition that there is in starch a lattice of the tetragonal system, the elementary cell of which is a square prism whose volume corresponds to that of the unit group, $C_6H_{10}O_5$.

Abstract in *Chem. abst.*, 1923, v. 17, p. 3117; *Chem. Zentr.*, 1923, Bd. 3, p. 834; *ibid.*, 1924, Bd. 1, p. 1658.

1284. **Sprockhoff.** Die spezifische Wärme und Befeuchtungswärme des Dextrins. (Zeitschrift für Spiritusindustrie, Berlin, 1922, Jahrg. 45, p. 217.) **VTZA**

The specific heats were determined calorimetrically by mixing with petroleum. The average value was 0.355 for anhydrous yellow dextrin and 0.363 for the white variety. The calculated specific heat of starch containing 18% water was 0.47. The average heat of wetting was 16.5 cals. per gr. of water free dextrin.

Abstract in *Chem. abst.*, 1923, v. 17, p. 2073; *Chem. Zentr.*, 1922, Jahrg. 93, Bd. 4, p. 898.

1285. **Visez**, A. Über die Herstellung eiweissbeständiger Biere und die Beziehungen der Eiweissbestandigkeit zum Dextringehalt des Bieres. (Wochenschrift für Brauerei, Berlin, 1922, Jahrg. 39, p. 73–75.)

Available in Library of the Department of Agriculture.

Shows that the dextrin in beer acts as a protective colloid and that stabilization can be effected by keeping the dextrin to nitrogen ratio as high as possible.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2941.

1286. **Benrath**, A., and K. Schaffganz. Über das räumliche Fortschreiten photochemischer Reaktionen in Gallerten. (Zeitschrift für physikalische Chemie, 1923, Leipzig, Bd. 103, p. 139–154.) **PKA**

Note that starch gellies do not appreciably absorb ultra-violet radiations. Concentrations of 10 and 20% starch are used.

Abstract in *Chem. abst.*, 1923, v. 17, p. 928; *Bull. soc. chim. France*, 1923, série 4, tome 34, p. 1005.

1287. **Farrow**, Frederick D., and Enoch Swan. Absorption of water by dried films of boiled starch. (Textile Institute, Journal, Manchester, 1923, v. 14, p. 465–474T.) **VLA**

Prepare films of .04 to .16 mm. thickness by drying aqueous pastes on slightly greased Al or ferrotype plates. By 2 methods determine relation between humidity and moisture content of the films. Find moisture absorbent power is reduced by prolonged heating and that wet starch persistently retains more water than it would have if introduced dry into the same atmosphere. Using 4 starches, find no marked variation in results. Discuss bearing of these results on drying of sized warps.

Abstract in *Chem. abst.*, 1924, v. 18, p. 907; *Chimie et industrie*, 1924, v. 11, p. 1189.

1288. **Fuerth**, Reinhold. Dielektrizitätskonstanten einiger wässriger Lösungen und

Starches and Dextrins, continued.

General Physical Characteristics, continued.

ihre Deutung nach der Dipoltheorie von Debye. (Annalen der Physik, Leipzig, 1923, Folge 4, Bd. 70, p. 63–80.) **PAA**

Notes that the dielectric constant of starch is 11.6 and that of dextrin 8.0.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1579; *Chem. Zentr.*, 1923, Bd. 3, p. 336.

1289. **Katz,** J. R. Weitere Untersuchungen über quellbare Krystalle. (Auszug.) (Chemisches Zentralblatt, Leipzig and Berlin, 1923, Bd. 1, p. 876.) **PKA**

Has carried out a mathematical investigation of the phenomenon of swelling. Previously developed relations are now shown to hold for amylodextrin.

Also abstracted in *Chem. abst.*, 1923, v. 17, p. 2526.

1290. **Lepeschkin,** W. W. Étude sur les réactions chimiques pendant le gonflement de l'amidon dans l'eau chaude. (Extrait.) (Botanical abstracts, Baltimore, 1923, v. 12, p. 865.)

Available in Library of Columbia University.

The swelling of starch in hot water proceeds in two stages: first, a reaction which results in the formation of hydrates of the polysaccharides of starch, and second, a swelling of these products. All acids except H_2SO_4 accelerate the hydration process.

Also abstracted in *Chem. abst.*, 1924, v. 18, p. 1599.

1291. —— Ueber die Stärkequellung und Hitzekoagulation der Eiweissstoffe. (Temperaturkoeffizienten in heterogenem Medium.) (Kolloid-Zeitschrift, Dresden and Leipzig, 1923, Bd. 32, p. 42–44.) **PKA**

Swelling of starch in hot water and coagulation of albumin by heat are different physically but similar chemically. Temperature coefficients of the changes show this. —*Chem. abst.*

Abstract in *Chem. Zentr.*, 1923, Bd. 1, p. 1593; *Jour. chem. soc.*, 1923, v. 124, part 1, p. 303.

1292. **Chamberlain,** G. E. Starch dust explosions. (Chemical age, New York, 1924, v. 32, p. 95–97.) † **VOA**

Discusses methods for reducing the hazard.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2251.

1293. **Harvey,** E. H. Some physico-chemical properties of starch. (American journal of pharmacy, Philadelphia, 1924, v. 96, p. 752–758.)

Available in Library of Columbia College of Pharmacy.

Using potato, corn and cassava starches, the following constants were determined: specific gravity, specific volume, moisture, ash, reaction of ash, heat of combustion, acidity, size of granules, gelatinizing temperature, gold number, direction of electrical migration, vapor tension of solutions, ignition temperature and specific inductive capacity. In the determination of starch various polariscopic measurements were found to give low results.

Abstract in *Chem. abst.*, 1925, v. 19, p. 415; *Chem. Zentr.*, 1925, Bd. 1, p. 390.

1294. —— Some physico-chemical properties of starch. 2. (American journal of pharmacy, Philadelphia, 1924, v. 96, p. 816–822.)

Available in Library of Columbia College of Pharmacy.

Determines hygroscopicity, viscosity, surface tension, and specific gravity.

Abstract in *Chem. abst.*, 1925, v. 19, p. 745.

1295. **Kruyt,** H. R., and H. J. C. Tendeloo. De bepaling der groote van onzichtbare deeltjes in emulsoïde solen. (Akademie van Wetenschappen te Amsterdam, Verslag, 1924, deel 33, p. 184–188.) * **EL**

Starch sols are investigated.

Abstract in *Chem. Zentr.*, 1924, Bd. 2, p. 443.

1296. **Neale,** S. M. Elasticity and tensile strength of starch. (Textile Institute, Journal, Manchester, 1924, v. 15, p. 443–452T.) **VLA**

Pure starch pastes and mixtures containing the common sizing ingredients were evaporated to form thin films, and the tensile properties of these films tested at 2 different humidities. The starch film behaved very much like a ductile metal, and there was scarcely any difference between the elastic properties of maize, farina, and sago starches.

Abstract in *Chem. abst.*, 1925, v. 19, p. 1636; *American dyestuff reporter*, 1925, v. 14, p. 66.

1297. **Trostel,** L. J., and H. W. Frevert. Lower limits of concentration for explosion of dusts in air. (Chemical and metallurgical engineering, New York, 1924, v. 30, p. 141–146.) **VOA**

For the 7 dusts investigated, list chemical composition, ignition temperature, heat of combustion, relative flammability and per cent passing 200 mesh screen. Note that corn starch shows the highest relative flammability.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1052.

1298. **Callow,** Ernest H. The velocity of ice crystallization through supercooled gelatin gels. (Royal Society of London, Proceedings, series A, v. 108, 1925, p. 307–323.) * **EC**

Notes that in supercooled starch gels the velocity of ice crystallization is of the same order as that of water.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 900.

1299. **Garard,** Ira D., and Grace E. Duckers. The preparation and properties of

Starches and Dextrins, continued.

General Physical Characteristics, continued.

some protected silver sols. (American Chemical Society, Journal, Easton, 1925, v. 47, p. 692–696.) **PKA**

Dextrin is included among substances used as protecting agents.

1300. Hatschek, Emil. Die Elastizität von Ammoniumoleat-Lösungen, und die variable Viskosität zweiphasiger Systeme. (Kolloid-Zeitschrift, Dresden and Leipzig, 1925, Bd. 37, p. 25–26.) **PKA**

Rice starch particles of about 3μ diameter are suspended in a mixture of toluene and carbon tetrachloride of about the same specific gravity as the starch. It is noted that when the sol is rotated the relative viscosity decreased as the rotation increased.

1301. King, J. Surface tension of liquids met with in biochemistry, with special reference to brewery worts. (Institutes of Brewing, Journal, London, 1925, v. 31, p. 32–37.) **VTRA**

A method has been devised based on the same principles as that of Morgan, Harkins and Brown. The surface tension of dextrin solutions is included among the determinations.

Abstract in *Chem. abst.*, 1925, v. 19, p. 2680.

1302. Kuerschner, Karl. Über Sublimation "unsublimierbarer" Stoffe. (Mikrochemie, Wien, 1925, Jahrg. 3, p. 1–20.)

Available in Library of Columbia University.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 705.

1303. Šandera, K. The influence of colloidal solutions upon the electrocapillarity of mercury. (Recueil des travaux chimiques des Pays-Bas, Amsterdam, 1925, tome 44, p. 480–487.) **PKA**

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 1346.

1304. Schaum, Karl. Ueber einige Vorgänge und Zustände in photographischen Bindemitteln und anderen Gelen. (Kolloid-Zeitschrift, Dresden, 1925, Bd. 36, Zsigmondy Festschrift, p. 199–203.) **PKA**

Drops of dextrin solutions were dried on Hg and the resulting figures noted.

Abstract in *Chem. abst.*, 1925, v. 19, p. 2897.

VISCOSITY AND PLASTICITY

1305. Thomson, William. On a method for the determination of the relative stiffness of paste produced by acting on flour or starch with boiling water. (Society of Chemical Industry, Journal, London, 1886, v. 5, p. 143–145.) **VOA**

Recommends a determination of penetration depth by iron spindle under standardized conditions.

Abstract in *Wag. Jahr.*, 1886, Jahrg. 32, p. 932; *Jahresber. Chem.*, 1886, p. 2147.

1306. Saare, Oscar, and P. Martens. Über die Bestimmung der Ausgiebigkeit der Stärke. (Zeitschrift für Spiritusindustrie, Berlin, 1903, N. F., Jahrg. 26, p. 436–437.)

Available in Library of the Patent Office.

The instrument described is a standardized means of recording the force required to withdraw a disk from starch paste, in which it has been imbedded.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 1153; *Wag. Jahr.*, 1903, Jahrg. 49, p. 215.

1307. Wolff, Jules, and Auguste Fernbach. Sur quelques circonstances qui influent sur l'état physique de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 1403–1406.) ***EO**

Starch pastes are heated at 120° for half an hour and, after cooling, their viscosities are determined. Find a relation between viscosity and alkalinity of the paste.

Abstract in *Jour. chem. soc.*, 1905, v. 88, part 1, p. 510; *Chem. Centr.*, 1905, Bd. 2, p. 121; *Jahresber. Chem.*, 1905–08, Theil 2, p. 938; *Bull. assoc. chimistes*, 1905–06, tome 23, p. 178.

1308. —— De l'influence de quelques composés minéraux sur la liquéfaction des empois de fécule. (Académie des sciences, Comptes rendus, Paris, 1906, tome 143, p. 363–365.) ***EO**

Starch is heated with water under pressure and the viscosity of the paste determined; previous treatment with small amounts of basic substances considerably increases the viscosity, while acids effect a marked decrease.

Reprinted in *Bull. assoc. chimistes*, 1906–07, tome 24, p. 571–572.

Abstract in *Jour. chem. soc.*, 1906, v. 90, part 1, p. 803; *Jour. soc. chem. ind.*, 1906, v. 25, p. 898; *Chem. Centr.*, 1906, Bd. 2, p. 1046.

1309. Ermen, W. F. A. The examination of commercial starches. (Society of Chemical Industry, Journal, London, 1907, v. 26, p. 501–504.) **† VOA**

Starches are differentiated by making solutions in the cold with the help of sodium hydroxide and determining their viscosities in a Redwood viscometer. Diagrams are given with curves showing influences of strength of starch solution and of temperature on viscosity.

Abstract in *Chem. abst.*, 1907, v. 1, p. 2313; *Chem. Centr.*, 1907, Bd. 2, p. 745; *Bull. assoc. chimistes*, 1907–08, tome 25, p. 580; *Bull. soc. chim. France*, 1907, série 4, tome 2, p. 1211.

Starches and Dextrins, continued.

Viscosity and Plasticity, continued.

310. **Bintz,** A., and Th. Marx. Zur Betimmung des Handelswertes der Stärke. Chemische Industrie, Berlin, 1909, Jahrg. 2, p. 167–169.) **3–VOA**

Describe modification of Saare and Maren's method for determining stiffness of tarch paste (*entry 1306*) which they have ound applicable to rice starch but not suitble for potato and wheat starches.

Discussed in *Zeitschrift für Spiritusindustrie*, 909, N. F., Jahrg. 32, p. 302.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 22; *Chem. Zentr.*, 1909, Bd. 1, p. 1509; *Jahresber. hem.*, 1909, Teil 2, p. 375.

311. **Cappenberg,** H. Über ein Viscoeter zur Vergleichung heisser Kleister. Chemiker-Zeitung, Cöthen, 1910, Jahrg. 4, p. 218–220.) **†† VOA**

Compares time required to draw a phere, under the pull of a known weight grams, through a column of the paste. ives diagram.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 6; *Chem. abst.*, 1910, v. 4, p. 1398; *Chem. Zentr.*, 10, Bd. 1, p. 1288.

312. **Harrison,** William. Some properties starch relating to its stiffening power. Society of Dyers and Colourists, Journal, radford, 1911, v. 27, p. 84–88.) **† VLG**

Method of comparison is based on the ct that when starch suspensions are ated to just above the swelling point and en cooled, the swelled granules can be parated by centrifuging, and the volume the deposit is proportional to the vissity, no matter what starch is used.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 4; *Chem. abst.*, 1912, v. 6, p. 298.

13. **Buel,** Hambden. A study of some of e physical properties of starches. (Intertional Congress of Applied Chemistry, h, Washington and New York, 1912, riginal communications, v. 13, p. 63–76.) **PKR**

Discussion, *ibid.*, v. 27, p. 109–110.

Determines consistency by observing ne required for 100 c.c. of a slightly alkae paste to be discharged from a glass nnel with detachable tip. The Doolittle rsion viscosimeter and three other meths are investigated. Discusses general apcation of consistency tests.

14. **MacNider,** G. M. A method for demining the value of commercial starches use in cotton mills. (Journal of indusal and engineering chemistry, 1912, v. 4, 417–422.) **VOA**

The sample is boiled with water for a finite length of time and the viscosity of hot solution measured by means of a ott viscosimeter; method is intended to closely duplicate the conditions of actual practice. Determines changes in viscosity produced by treating starch with borax, boric acid and alkali.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 680; *Chem. abst.*, 1912, v. 7, p. 550.

Summarized in *Fibre and fabric*, Boston, 1913, v. 57, no. 1453, p. 18, 20.

1315. —— The value of commercial starches for cotton mill purposes. (Elisha Mitchell Scientific Society, Journal, Durham, N. C., 1912, v. 28, p. 135–145.) *** EA (North Carolina)**

An abridgment of above article. Formulas used in practice are added.

1316. **Samec,** Max. Studien über Pflanzenkolloide. 2. Die Lösungsstabilität der Stärke. (Kolloidchemische Beihefte, Dresden and Leipzig, 1912–13, Bd. 4, p. 132–174.) **PKA**

Studies decrease in viscosity of starch solutions when kept alone and in the presence of electrolytes. Finds the decrease in viscosity is accompanied by an increase in conductivity. Results are explained in terms of an ionized starch-phosphoric acid complex.

Abstract in *Chem. Zentr.*, 1913, Bd. 1, p. 632–634; *Jour. soc. chem. ind.*, 1913, v. 32, p. 102; *Chem. abst.*, 1913, v. 7, p. 3767; *Jour. chem. soc.*, 1913, v. 104, part 1, p. 17; *Bull. assoc. chimistes*, 1912–13, tome 30, p. 666–667.

1317. **Hatschek,** Emil. Die Viscosität der Emulsoidsole und ihre Abhängigkeit von der Schergeschwindigkeit. (Kolloid-Zeitschrift, Dresden and Leipzig, 1913, Bd. 13, p. 88–96.) **PKA**

Includes determination of viscosity of starch solutions of varying concentration and age. Measurements are made by means of Couette's apparatus.

Abstract in *Chem. abst.*, 1914, v. 8, p. 281; *Chem. Zentr.*, 1913, Bd. 2, p. 1642.

1318. **Ravizza,** Vittore. Schnelle Prüfung des zu Appreturzwecken bestimmten Kartoffelmehls. (Färben-Zeitung, Berlin, 1913, Jahrg. 24, p. 416–419.) **† VLA**

By means of a pipette surrounded by a water jacket, the viscosity is determined at regular intervals during cooking of the starch. Samples showing the largest maximum value are most satisfactory for stiffening textiles.

Abstract in *Chem. abst.*, 1914, v. 8, p. 2064; *Chem. Zentr.*, 1913, Bd. 2, p. 2170.

1319. **MacMichael,** R. F. A new direct-reading viscosimeter. (Journal of industrial and engineering chemistry, Easton, 1915, v. 7, p. 961–963.) **VOA**

Measures force exerted by the rotation of the fluid itself on the stationary member. Suggests that it may be applied to starch solutions.

Starches and Dextrins, continued.

Viscosity and Plasticity, continued.

1320. **Determining** the viscosity of starch for mill purposes. (Fibre and fabric, Boston, 1917, v. 65, Nov. 10, p. 13.) **VLA**

1321. **MacNider,** G. M. A practical method for determining the viscosity of starch for mill purposes. (Journal of industrial and engineering chemistry, Easton, 1917, v. 9, p. 597–599.) **VOA**

Purpose is to duplicate actual treatment of starch in preparation for warp sizing, etc. Constructs a miniature size kettle, similar to the large kettles used in cooking starch; boils solution for one hour and determines viscosity in Scott viscosimeter. Gives photo.

Abstract in *Jour. soc. chem. ind.*, 1917, v. 36, p. 899; *Chem. Zentr.*, 1918, Bd. 1, p. 873.

1322. **Abrams,** Allen. Viscosity and sticking strength of binders. (Textile world journal, New York, 1919, v. 55, p. 3957–3961.) **† VLA**

Pearl starch and dextrin are tested.

Abstract in *Chem. abst.*, 1919, v. 13, p. 2137.

1323. **Herschel,** Winslow H., and Carl Bergquist. The consistency of starch and dextrin pastes. (Journal of industrial and engineering chemistry, Easton, 1921, v. 13, p. 703–706.) **† VOA**

When tested with a modified Bingham and Greene plastometer, starch and dextrin pastes at the concentrations at which they are used were found to be plastic solids. The body, spreading capacity, and setting power of the different samples were indicated by the differences in the yield, shear values and rigidities determined by this method. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1922, Jahrg. 93, Bd. 2, p. 421.

1324. **Porst,** Christian E. G., and M. Moskowitz. Comparison of the various corn products starches as shown by the Bingham-Greene plastometer. (Journal of industrial and engineering chemistry, Easton, 1922, v. 14, p. 49–52.) **VOA**

A continuation of the work in *entry 1323*. Using two capillaries, carry out tests on 5 thick boiling starches, 5 thin boiling starches and "Mazam," a partly dextrinized starch containing 4–6% reducing sugars; about 3 concentrations were tested for each starch. Find results are considerably influenced by temperatures at which pastes are prepared. The plastometer is of value in determining what product will satisfy a particular requirement and as an aid in matching submitted products.

Abstract in *Chimie et industrie*, 1922, v. 8, p. 1096.

1325. **Farrow,** Frederick D., and G. M. Lowe. Flow of starch paste through capillary tubes. (Textile Institute, Journal, Manchester, 1923, v. 14, p. 414–440T.) **VLA**

A study of viscosity measurements in relation to sizing of cotton warps. Using the Ostwald, Ubbelohde, and interchangeable types of viscosimeters, investigate viscosities of various starches at 90° and, in some cases, at variable pressures. 10 tables and 20 charts are given.

Abstract in *Chem. abst.*, 1924, v. 18, p. 606–607; *Jour. soc. chem. ind.*, 1924, v. 43, p. 50B.

1326. **Porst,** Christian E. G., and M. Moskowitz. Plastometer tests on alkaline thin-boiling cornstarches. (Industrial and engineering chemistry, Journal, Easton, 1923, v. 15, p. 166–170.) **VOA**

A continuation of the application of the Bingham-Green plastometer to the study of paste characteristics of cornstarches. Use 7 thin-boiling starches, each treated with various amounts of alkali. Results are given in tables and curves; for the curves, complete logarithmic equations have been calculated. Summarize numerous tests on thick-boiling starches.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1165; *Chem. Zentr.*, 1923, Bd. 2, p. 1220; *Chimie et industrie*, 1923, v. 10, p. 1143.

1327. **Farrow,** Frederick D. Recent advances in the experimental study of warp sizing. (Faraday Society, Transactions, London, 1924, v. 20, p. 303–308.) **PPO**

Previous work on the viscosity of starch pastes is discussed.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2608.

1328. **Rask,** O. S., and Carl L. Alsberg. A viscosimetric study of wheat starches. (Cereal chemistry, St. Paul, 1924, v. 1, p. 7–26.) **VPMA**

Investigate relation of viscosity to wheat variety, geographical source, chemical composition and baking quality of flour. In preparing the starch the flour is kneaded with water, NaCl added to the resulting starch suspension, the starch thrown down by centrifuging, washed successively with water, alcohol and ether and finally dried in a vacuum dessicator. The 11 purified samples contained about 4% moisture and .039% N. Using concentrations of 2.85 to 5.75%, viscosities were determined at 90° by means of the Stormer rotating cylinder viscosimeter. In preliminary experiments it was noted that at 25° the viscosity readings decreased with each successive determination whereas at 90° the readings were approximately constant; these results were attributed to plasticity effects at the lower temperature. Viscosity results at 90° were converted to centipoise units and their logarithms plotted against arithmetical concentrations; equations were computed for each *tarches and Dextrins, continued.*

iscosity and Plasticity, continued.

tarch. The viscosities of 5.5% suspensions
aried from 51 to 213.5 centipoises accord-
ig to the origin of the starch. The results
id not appear to be affected by pH varia-
ons. Winter wheat starches, in general,
xhibited higher viscosities than summer
heat starches.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43,
532B; *Chem. Zentr.*, 1924, Bd. 2, p. 557; *ibid.*,
25, Bd. 2, p. 862.

329. **Jong,** H. G. Bungenberg de. The
lectro-viscous effect in solutions of soluble
arch. (Recueil des travaux chimiques des
ays-Bas, Amsterdam, 1924, tome 43, p.
39–202.) **PKA**

A systematic study of the influence of
eutral salts on the viscosity of starch so-
tions. Using Merck's soluble starch, a
l was prepared which fulfilled the
quirements of Poiseuille's law. The
arked lowering of viscosity which occurs
ith the smallest electrolyte concentrations
interpreted as a discharge phenomenon.
ith NaOH and $Ca(OH)_2$ the shape of the
scosity curve deviates considerably from
e normal, the behavior being ascribed to
important increase of the lyophilic prop-
ties of the starch particles in alkaline
edia.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2451;
ur. chem. soc., 1924, v. 126, part 2, p. 314; *Chem.
ntr.*, 1924, Bd. 1, p. 2333.

30. **Yoshino,** M. Starch paste. 1. Rela-
n between the viscosity of wheat starch
ste and the concentration and tempera-
re. (Abstract.) (Society of Chemical Industry, Journal, London, 1924, v. 43, p. 144B.) **†VOA**

Viscosity was measured by an Ostwald capillary viscosimeter at 20°, 30°, 40° and 50°, for the range of 0.5–2.5% concentration. Results show the relation between viscosity and concentration is expressed satisfactorily by the formula of Arrhenius.

Also abstracted in *Chem. abst.*, 1924, v. 18, p. 2274.

1331. **Bergquist,** Carl. Plasticity of starch paste. (Journal of physical chemistry, Ithaca, 1925, v. 29, p. 1264–1265.) **PKA**

Abstract in *Chem. abst.*, 1926, v. 20, p. 530.

1332. **Kruyt,** H. R. Lyophile Kolloide und das Poiseuille'sche Gesetz. (Kolloid-Zeitschrift, Dresden, 1925, Bd. 36, Zsigmondy Festschrift, p. 218–230.) **PKA**

Starch solutions obey the law of Poiseuille.

Abstract in *Chem. abst.*, 1925, v. 19, p. 3049; *Chem. Zentr.*, 1925, Bd. 2, p. 1344.

1333. **Ostwald,** Wolfgang. Quantitative Filtrationsanalyse als dispersoidanalytische Methode. (Kolloid-Zeitschrift, Dresden and Leipzig, 1925, Bd. 36, p. 46-55.) **PKA**

When potato starch was heated with 2N NaCl solution, a marked retardation of filtration velocity was noted although the viscosity was hardly affected.

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 2098.

1334. —— Über die Geschwindigkeitsfunktion der Viscosität disperser Systeme. 2. (Kolloid-Zeitschrift, Dresden and Leipzig, 1925, Bd. 36, p. 157–167.) **PKA**

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 2361.

GELATINIZATION

35. **Payen,** A. Nouveaux faits sur l'ami-
n. (Annales de chimie et de physique,
ris, 1836, tome 61, p. 355–374.) **PAA**

Studies mechanism of hydration, swelling
d rupture of starch grains.

36. **Lippmann,** Eduard. Ueber die Klei-
rbildung bei verschiedenen Stärkearten.
urnal für praktische Chemie, Leipzig,
1, Bd. 83, p. 51–53.) **PKA**

By microscopical observations determines
nperature of swelling and of gelatiniza-
n of 16 starches.

Abstract in *Chem. Centr.*, 1861, p. 859; *Wag.
r.*, 1861, Jahrg. 7, p. 359; *Ding. poly. Jour.*, 1861,
162, p. 450.

37. **Meusel,** E. Untersuchung über die
ellkraft der Rhodanate. (Auszug.)
hresbericht der Chemie, Giessen, 1886,
2099–2101.) **PKA**

Notes that various thiocyanates gelatinize
rch at the ordinary temperature; con-
tration of the salts is an important factor. Starch is also gelatinized by calcium chloride and potassium acetate. The gelatinized starch is precipitated with alcohol, dried at the ordinary temperature and found to possess certain characteristic properties; this modification is termed fractose.

Also summarized in *Annalen der Physik und Chemie, Beiblätter,* Leipzig, 1888, Bd. 12, p. 565–566, *PAA.*

1338. **Lintner,** Carl J. Über die Kleisterbildung bei einigen Stärkesorten. (Wochenschrift für Brauerei, Berlin, 1889, Jahrg. 6, p. 285–287.)

Available in Library of the Brewers' Academy.

Studies behavior of starch grains when heated in aqueous suspension; also studies behavior towards iodine. Results are tabulated.

Abstract in *Chem. Centr.*, 1889, Bd. 1, p. 625; *Wag. Jahr.*, 1889, Jahrg. 35, p. 865.

1339. **Schaer,** Eduard. Ueber ein merkwürdiges Verhalten des Chloralhydrates zu

Starches and Dextrins, continued.

Gelatinization, continued.

Stärkemehl und Jod. (Pharmaceutische Centralhalle, Dresden, 1896, Jahrg. 37, p. 540–542.)

Available in Library of Columbia College of Pharmacy.

Finds starch is rapidly gelatinized by chloral hydrate in the cold. Under certain conditions, excess of iodine-chloral hydrate does not effect gelatinization, whereas excess of chloral hydrate seems to prevent formation of blue starch iodide.

Abstract in *Jour. chem. soc.*, 1897, v. 72, part 1, p. 454; *Chem. Centr.*, 1896, Bd. 1, p. 661.

1340. **Solubilité** de l'amidon dans les persulfates. (Extrait.) (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1902–03, tome 20, p. 773.) **VOA**

Starch is treated for 10 hours with a 2–3% solution of ammonium persulphate, washed carefully and dried in a drying chamber. The product has all the properties of gelatin. Equivalent quantities of potassium or sodium persulphates may be used as well.

1341. **Levites,** S. A. Gelatinization. [Title translated.] (Russian Physical Chemistry Society, Journal, St. Petersburg, 1902, tome 34, p. 110–118.) **PKA**

Studies effect of salts on gelatinization of starch, gelatine and δ-galactane. Concentrations of salts and corresponding gelatinization temperatures are tabulated. Believes the results are not due to chemical action but to greater solubility of the colloids in salt solutions.

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 2, p. 312; *Chem. Zentr.*, 1902, Bd. 1, p. 1305; *Bull. soc. chim. Paris,* 1902, série 3, tome 28, p. 915.

1342. **Mauch,** Richard. Über die Quellung und Lösung der Stärke durch Chloralhydrat und den Einfluss des Chloralhydrats auf die Verzögerung oder das Ausbleiben der Jodstärkereaktion. (Archiv der Pharmazie, Berlin, 1902, Bd. 240, p. 166–178.)

Available in Library of Columbia College of Pharmacy.

Solutions of chloral hydrate at 40 to 70% concentrations cause starch to swell and dissolve but 80% solutions do not exhibit this effect until the suspension has been heated to about 100°. The latter concentrations are also effective in preventing the blue I reaction. The behavior of various starches differs according to their origin. Suggests the use of chloral hydrate in the preparation of pure amylogene and amylodextrin.

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 1, p. 426; *Chem. Centr.*, 1902, Bd. 1, p. 1199; *Bull. soc. chim. Paris,* 1902, série 3, tome 28, p. 818–820.

1343. **Nyman,** Max. Untersuchungen über die Verkleisterungstemperatur bei Stärkekörnern. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1912, Bd. 24, p. 673–676.) **VTA**

The starches were suspended in water and examined under the micropolariscope; the temperature at which the grains ceased to show interference crosses was taken as the gelatinizing temperature. Wheat starch is distinguished by its relatively low rate of gelatinization.

Abstract in *Chem. Zentr.*, 1913, Bd. 1, p. 330; *Jour. chem. soc.*, 1913, v. 104, part 2, p. 160; *Jour. soc. chem. ind.*, 1913, v. 32, p. 40.

1344. **LaWall,** Charles H., and Sara S. Graves. Studies in carbohydrates. The composition and digestibility of wheat bread and allied foods. Gelatinization of starches. (Wagner Free Institute of Science, Transactions, Philadelphia, 1913, v. 7, part 2, p. 37–45.) *** EA**

Includes microscopic examination and determination of gelatinization temperature of a number of starches.

Abstract in *Chem. abst.*, 1913, v. 7, p. 3798.

1345. **Francis,** C. K., and O. C. Smith. Determination of the gelatinizing temperature of the starches from grain sorghums by means of a thermo-slide. (Journal of industrial and engineering chemistry, Easton, 1916, v. 8, p. 509–511.) **† VOA**

Give details and diagrams of apparatus. Find gelatinizing temperature varies with rate of heating. Determine gelatinizing temperatures for 11 sorghum starches and 6 common starches.

Abstract in *Chem. abst.*, 1916, v. 10, p. 2995; *Jour. soc. chem. ind.*, 1916, v. 35, p. 750; *Chem. Zentr.*, 1918, Bd. 1, p. 573.

1346. **Dox,** Arthur W., and G. W. Roark. Determination of gelatinization temperatures of starches by means of an electrically heated chamber on the microscope stage. (American Chemical Society, Journal, Easton, 1917, v. 39, p. 742–745.) **PKA**

The gelatinization temperatures of 13 varieties of maize starch were found to vary from 64 to 71°, although concordant results were obtained for each variety.

Abstract in *Chem. abst.*, 1917, v. 11, p. 1763; *Jour. soc. chem. ind.*, 1917, v. 36, p. 560.

1347. **Arzichowski,** V. Über die Quellungstemperatur der Stärkekörner. [Title translated.] (Académie des sciences de Russie, Bulletin, Petrograd, 1918, série 6, tome 12, p. 349–368.) *** QCB**

The swelling of starch granules was studied microscopically, a statistical method being used. Swelling begins at 55°; at 67.5° it is practically complete. The mean tem-

Starches and Dextrins, continued.

Gelatinization, continued.

perature of complete swelling of individual granules is 60.97 plus or minus 0.10°. The distribution about this mean value only follows Gauss' law of error as a first approximation. The frequency curve is asymmetrical, but there is no indication of the occurrence of 2 kinds of granules.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 2543.

1348. **Courtonne**, H. De l'action contraire des chlorures et des sulfates solubles sur les matières amylacées. (Académie des sciences, Comptes rendus, Paris, 1920, tome 171, p. 1168–1170.) ***EO**

Certain chloride solutions are capable of converting starch to starch paste and, at higher temperatures, to soluble starch. Magnesium chloride, the most soluble, is he most effective. Sulphates retard these changes. Starch grains, in a saturated solution of magnesium sulphate, show no igns of swelling even at a temperature of 15°.

Reprinted in *Bull. assoc. chimistes*, 1920–21, tome 3, p. 316–317.

Abstract in *Jour. soc. chem. ind.*, 1921, v. 40, p. 5A.

349. **Herter**, W. Die Unterscheidung der Weizen- und Roggenstärke auf Grund ihrer Verkleisterungstemperatur. (Textilberichte ber Wissenschaft, Industrie und Handel, Melliand's, Mannheim, 1920, Jahrg. 1, p. -9, 31.)

Available in Library of the Chemists' lub.

The gelatinization of rye starch begins at –50° and that of wheat starch at 50–55°. ye starch is completely gelatinized at 70–°, while wheat starch requires a higher mperature.

Abstract in *Chimie et industrie*, 1921, v. 5, p. 78.

350. **Reychler**, Albert. Sur la gélification l'amidon dans l'eau froide en présence alcalis ou de sels neutres. (Société chimique de Belgique, Bulletin, Bruxelles, 20, tome 29, p. 118–122.) **PKA**

Starch grains are rapidly gelatinized by lutions of KOH and NaOH. Tabulates ncentrations of neutral substances which fect gelatinization as rapidly as a .75% OH solution. From his study of mechan- m of gelatinization, concludes that there e two hila in each granule and between e two runs an axial canal which is hollow else filled with amylaceous material especially accessible to alkaline or salt solutions.

Abstract in *Chem. abst.*, 1921, v. 15, p. 3576; *Chem. Zentr.*, 1921, Bd. 1, p. 563; *Bull. soc. chim. France*, 1920, série 4, tome 27, p. 774.

1351. —— Études sur la fécule. (Société chimique de Belgique, Bulletin, Gand, 1920, tome 29, p. 309–317.) **PKA**

A microscopical investigation of gelatinization in the presence of alkalis and concentrated salt solutions and of coagulation (retrogradation) in the presence of certain other salts. Describes behaviour of amylose and amylopectin under these conditions. Objects to the term "amylopectin" as applied to the deposit formed from a 0.1% starch paste, this deposit being a mixture of swollen grains and debris of granular envelopes.

Abstract in *Chem. abst.*, 1921, v. 15, p. 3565; *Chem. Zentr.*, 1921, Bd. 3, p. 1000.

1352. **Huss**, Harald. Untersuchungen über die Quellung der Stärkekörner. (Arkiv för botanik, Stockholm, 1922–24, bd. 18, no. 8, p. 1–23.) **QEA**

Starch grains are stained in dilute solutions of certain specified dyes, whereas in solutions of other dyes they are stained only after the grains have been ruptured. The process of swelling may, at times, be studied more conveniently by the use of these stains than by the use of polarized light.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2540.

1353. **Alsberg**, Carl L., and O. S. Rask. On the gelatinization by heat of wheat and maize starch. (Cereal chemistry, St. Paul, 1924, v. 1, p. 107–115.) **VPMA**

Discrepancies in recorded temperatures of gelatinization are attributed to differences in preliminary treatment of the starches, to differences in horticultural varieties of the same species and to differences in methods of observation. Samples of wheat and corn starches were prepared and the viscosity of their suspensions determined at concentrations ranging from 3 to 10% and at temperatures ranging from 25° to 96°. The Stormer viscosimeter was used and readings were taken at 1° and 2° intervals. Up to 65° there was no significant change in viscosity, at 68° a gradual increase began and at 95° a maximum was reached. At 90° the viscosity of a 5% suspension of corn starch was about 30 times greater than at 25°. Gelatinization is regarded as a gradual process proceeding in stages over a range of 20° to 25°. Anisotropy is attributed to a tension in the starch granule which is relieved in the earlier stages of gelatinization.

Abstract in *Chem. Zentr.*, 1925, Bd. 2, p. 1565.

(To be continued)

INTERESTING RECENT ADDITIONS

Industries and Industrial Arts

Agg, Thomas R., and J. E. Brindley. Highway administration and finance. New York: McGraw-Hill Book Company, 1927. x, 382 p. diagrs. 8°. $4.00. **VDG (121)**

An excellent history of highway administration in the United States is followed by chapters dealing with legislative and financial features, and the organization and supervision of the staff engaged in the construction and maintenance of roads and pavements. Authors are professors, respectively, of highway engineering and economics, in Iowa State College.

Reviewed in *Canadian engineer,* April 19, 1927.

A'Hearn, Frank M. Fundamentals of the locomotive machine shop. New York: Simmons-Boardman Publishing Company, 1926. xiii, 242 p. illus. 12°. $2.50. **TPE (121)**

"First, to render a service to the beginner by describing many simple operations in machining locomotive parts. Second, to outline to the more advanced workman, the supervisor, and to those interested, but not directly engaged in machine shop work, a summary of the methods and tools commonly used in railroad shops. Third, to give a few suggestions to aid in securing satisfactory results in machine tool installation and operation."

Brown, Harry Bates. Cotton: history, species, varieties, morphology, breeding, culture, diseases, marketing, and uses. New York: McGraw-Hill Book Company, Inc., 1927. xi, 517 p. illus. 8°. $5.00. **VLLD (121)**

Up-to-date work by the Professor of Cotton Breeding at Louisiana State University. Numerous statistics. Bibliographies at chapter endings.

Clark, George L. Applied X-rays. New York: McGraw-Hill Book Company, Inc., 1927. xiii, 255 p. illus. 8°. $4.00. **PEW (117)**

Part I tells of the generation and properties of X-rays, absorption, spectroscopy, scattering, and the determination of atomic structure; Part II describes the various effects produced, measurement of intensity, and application to industry and medicine; Part III discusses X-ray analysis and the ultimate structure of materials. Author is a professor in the Massachusetts Institute of Technology.

Daniels, Ara Marcus. Warm-air furnace heating. New York: Edwin A. Scott Publishing Company, 1927. xi, 451 p. illus. 8°. $5.00. **VEW (121)**

Gives the results of recent scientific investigations conducted by the University of Illinois and the National Warm Air Heating and Ventilating Association. A thorough, well-diagramed text covering the history of the subject, different types of apparatus, heat losses, design and insulation of pipes, air supply, chimneys and flues, humidity, combination systems, hot water supply, fuel, fittings. In the appendix is a standard code for installation, various trade names, and useful tables.

Darby, W. D. Linen, the emblem of elegance. A survey of linen manufacture from the raw material to the finished product, including a brief history of linen and a dictionary of linen fabrics, supplemented by chapters on the merchandising, display, and advertising of linens in the store. New York: Dry Goods Economist, 1926. v, 79 p. illus. 12°. $1.50. **VLO (121)**

"It aims merely to embody in brief form and simple terms enough facts concerning linen to serve as a useful background of information for those who are interested in the subject." — *Preface.*

* **Du Toit,** Alexander L. The geology of South Africa. Edinburgh: Oliver and Boyd, 1926. xi, 463 p. illus. map. 8°. 28s. **PVW (117)**

"Contains an immense amount of detailed information which it has only been possible to keep within reasonable bounds by the employment of two sizes of type in the text... Du Toit emphasizes the vastness of the mineral resources of South Africa, pointing out that this country is the main producer of the world's diamonds, half of the world's gold, and in addition has enormous reserves of coal, iron ore, chrome iron ore, the base metals — copper, lead and zinc — and asbestos... A readable book which no doubt will be the text-book of South African geology for many years to come." — *F. H. Hatch in Mining magazine, Feb., 1927.*

Edwards, Ivo, and F. Tymms. Commercial air transport, with a foreword by Sir Sefton Brancker. London and New York: Isaac Pitman and Sons, 1926. xv, 163 p. illus. 8°. $2.50. **VDY (121)**

This English work discusses in a general way the problems of financing, legislation, principles of organization and operation, and the main technical developments which are now in progress.

Ewing, Sir J. Alfred. The steam-engine and other heat engines. Cambridge, England: The University Press; New York: The Macmillan Company, 1926. vi, 662 p. 4. ed. rev. & enl. illus. 8°. 25s. **VFK (121)**

"The text has been revised throughout, the remarkable development during recent years, both of steam turbines and of internal-combustion engines, having made it necessary to rewrite considerable sections of the text. Some modifications have also been made in the presentation of the theory. The work is very comprehensive... There are numerous illustrations, many of which represent the latest practice of the builders." — *Engineering, Feb. 11, 1927.*

Hager, Dorsey. Practical oil geology, the application of geology to oil field problems. New York: McGraw-Hill Book Company, 1926. xii, 309 p. 4. ed. illus. 12°. $3.00. **VHY (117)**

New edition includes more complete discussion of theories of origin, porosity of reservoir sands, core-drilling for structure, and the use of the seismograph and the torsion balance in exploration.

"The greater part of the book, however, may be read with profit by any intelligent reader, and it is commended to the young geologist and petroleum engineer as a convenient summary of the leading principles of exploration and exploitation." — *J. Volney Lewis in Engineering and mining journal, March 12, 1927.*

McCann, E. Armitage. Ship model making. New York: The Norman W. Henley Publishing Company, 1926. 2 v. illus. 8°. Each volume, $2.50. **VXH (121)**

These two attractive volumes tell in detail of the tools, building, painting and decorating a Barbary

Industries and Industrial Arts, continued.

felucca, a Spanish galleon, and an American clipper ship. There are four large plans and numerous illustrations that really illustrate. A third volume embracing the U. S. S. *Constitution* is to be published soon.

Macpherson, Hector. Modern astronomy, its rise and progress. New York: Oxford University Press, American Branch, 1926. 196 p. illus. 12°. $2.00. **OMD (Stack 3)**

Up-to-date work for the layman, with an historical background and portraits of famous astronomers.

Reviewed in *Nature,* March 19, 1927.

* **Michel,** Hermann. Die künstlichen Edelsteine. Eine zusammenfassende Darstellung ihrer Erzeugen, ihrer Unterscheidung von den natürlichen Steinen und ihrer Stellung im Handel, mit je einem Abschnitte über Verfälschungen der Edelsteine und über Perlen. Leipzig: Wilhelm Diebner G.m.b.H., 1926. viii, 477 p. 2. ed. illus. 4°. 25 mks. **PWV (117)**

Fourfold expansion of the first edition (1914, 109 p.). Treats of the manufacture of commercial stones and of stones as yet unadapted to the market; of the methods of distinguishing the natural from the artificial gem; of the influence of the artificial product on the prices of the natural stones; of counterfeiting; and of the composition, counterfeiting, and investigation of pearls. Attractively illustrated.

Reviewed in *Mineralogical magazine, Abstracts,* Dec., 1926, p. 157.

Morrow, L. W. W. Electric power stations. New York: McGraw-Hill Book Company, 1927. viii, 326 p. illus. diagrs. 8°. $4.00. **VGMB (121)**

Copiously diagramed text dealing exclusively with stations operated by steam. Discusses the selection of site, fuels, fuel and ash handling, steam generation and utilization, auxiliary energy supply and heat balance systems, boiler room equipment and layout, turbines and turbine auxiliaries, electrical layout and equipment, and switching practice.

Rastall, R. H. Physico-chemical geology. London and New York: Longmans, Green and Company, 1927. vii, 248 p. diagrs. 8°. $6.00. **PTK (117)**

Contents: The states of matter and the principle of equilibrium in geology. Fusion and solidification. Solutions. Isomorphism and solid solution. Polymorphism and inversions. The igneous rocks. Mineral formation in igneous rocks. Metamorphism. The physical chemistry of rock-weathering. The salt deposits. Ore deposits. Refractories and abrasives. Colloids in geology.

"It is not intended for beginners in geology, since an acquaintance with the general principles of the science as set forth in any elementary textbook, as well as some knowledge of mineralogy, is assumed." —*Preface.*

Reviewed in *Mining journal,* March 19, 1927.

Southworth, J., and T. L. J. Bentley. Photographic chemicals and chemistry. London and New York: Isaac Pitman and Sons, 1927. vi, 121 p. 12°. $1.50. **MFH (Stack 4)**

"Despite its elementary treatment of the subject, the volume is designed to give the reader a fully up-to-date and reasonably accurate account of the known facts and the theories that mark the modern science of photographic processes." — *Preface.*

Sumner, James B. Textbook of biological chemistry. New York: The Macmillan Company, 1927. xxv, 283 p. 8°. $3.50. **PPB (119)**

Elementary work by the Assistant Professor of Biological Chemistry in Cornell University. Although a knowledge of organic chemistry is essential for getting the most out of the book, there is much of value to the layman who is interested in learning of vitamines, enzymes, and other chemical factors that make for health.

* **Travers,** L. Elmer, and L. H. Werner. A modern course in model cutting and shoe designing. As conducted by the Brooklyn School of Shoe Designing. v. 1. Boston: The Gill Publications, 1926. 161 p. illus. 8°. $12.50. **VMKB (121)**

Detailed and copiously diagramed instructions for lasting and designing certain types of women's shoes.

Philosophy and Religion

Allier, Raoul Scipion Philippe. La psychologie de la conversion chez les peuples non-civilisés... Paris: Payot, 1925. 2 v. 8°. **ZIK**

Tome 1. Les prodromes de la crise. La crise. Tome 2. Les conséquences de la crise.

Cooke, Richard Joseph. Did Paul know of the virgin birth? An historical study. New York: The Macmillan Company, 1926. 152 p. 12°. **ZFHD**

Cranage, David Herbert Somerset. The home of the monk; an account of English monastic life and buildings in the Middle Ages. Cambridge: University Press, 1926. xi, 122 p. illus. 8°. **ZMT**

Dimond, Sydney G. The psychology of the Methodist revival; an empirical & descriptive study. London: H. Milford, 1926. xv, 296 p. 8°. **ZKY**

Du Jarric, Pierre. Akbar and the Jesuits; an account of the Jesuit missions to the court of Akbar, by Father Pierre Du Jarric ... Translated with introduction and notes by C. H. Payne. London: G. Routledge & Sons, Ltd. [1926.] xlviii, 288 p. illus. 8°. (The Broadway travellers.) **ZKVG**

Flewelling, Ralph Tyler. Creative personality; a study in philosophical reconciliation. New York: The Macmillan Company, 1926. 320 p. 12°. **YB**

Giacometti, Zaccaria. Quellen zur Geschichte der Trennung von Staat und Kirche. Tübingen: J. C. B. Mohr, 1926. xxiv, 736 p. 8°. **ZKBK**

Goad, Harold Elsdale. Franciscan Italy. London: Methuen & Co., Ltd. [1926.] xii, 284, 8 p. illus. 8°. **ZMV**

Grossman, Mordecai. The philosophy of Helvetius, with special emphasis on the educational implications of sensationalism. New York City: Teachers College, Columbia University, 1926. 3 p.l., 181 p. 8°.

Philosophy and Religion, continued.

(Teachers College, Columbia University. Contributions to education. no. 210.) YBX

Hasse, Heinrich. Schopenhauer. München: E. Reinhardt, 1926. 516 p., 1 port. 8°. (Geschichte der Philosophie in Einzeldarstellungen. Bd. 34.) **YBA**

Hutton, Edward. The Franciscans in England, 1224–1538. London: Constable & Co., Ltd. [1926.] 325 p. 12°. **ZMV**

Liber pontificalis. Liber pontificalis prout exstat in codice manuscripto dertusensi textum genuinum complectens hactenus ex parte ineditum Pandulphi, scriptoris pontificii; editus, illustratus, commentariis auctus a Josepho M. March...accedit memoriale ecclesiarum Romae. Barcinone: "La educación," 1925. 251 p. illus. 4°. **† ZLI**

Maréchal, Christian. La Mennais; la dispute de l'Essai sur l'indifférence. D'après des documents nouveaux et inédits. Paris: É. Champion, 1925. x, 455 p. 8°. **ZET**

Powicke, Frederick James. The Cambridge Platonists; a study. London: J. M. Dent and Sons, Ltd., 1926. x, 219 p. illus. 12°. **YBXC**

Contents: Some characteristics of the Cambridge Platonists. Benjamin Whichcote. John Smith. Ralph Cudworth. Nathaniel Culverwel. Henry More. Peter Sterry.

Puckett, Newbell Niles. Folk beliefs of the southern negro. Chapel Hill: The University of North Carolina Press; London: H. Milford, 1926. xiv p., 2 l., 644 p. illus. 8°. **ZBIX**

Rohne, John Magnus. Norwegian American Lutheranism up to 1872. New York: The Macmillan Company, 1926. xxiv p., 1 l., 271 p. 8°. **ZSK**

Smuts, Jan Christiaan. Holism and evolution. New York: The Macmillan Company, 1926. vii p., 2 l., 362 p. 8°. **YB**

Summers, Montague. The history of witchcraft and demonology. New York: A. A. Knopf, 1926. xv, 353 p. illus. 8°. (History of civilization.) **YPC**

Thomas, of Eccleston. The coming of the Friars Minor to England & Germany, being the chronicles of Brother Thomas of Eccleston and Brother Jordan of Giano, translated from the critical editions of A. G. Little...& H. Boehmer, by E. Gurney Salter... London: J. M. Dent and Sons, Ltd., 1926. xxxvi, 198 p. illus. 12°. **ZMV**

Whittaker, Thomas. The metaphysics of evolution, with other essays [new and republished]. London: Williams & Norgate, Ltd., 1926. viii, 480 p. 8°. **YAR**

Woodburne, Angus Stewart. Human nature and education. London: H. Milford, 1926. ix, 292 p. illus. 8°. **YEM**

ART

Alexandre, Arsène. Maxime Maufra, peintre marin et rustique (1861–1918). Paris: G. Petit, 1926. 211 p. illus. 4°. **MCO (Maufra)**

Baker, Charles Henry Collins. Dutch painting of the seventeenth century. London: "The Studio," Ltd., 1926. xiii, 62 p., 70 pl. 8°. ([Studio special number 1926.]) **MCG**

Baud-Bovy, Daniel. Schweizer Bauernkunst... Zürich: O. Füssli, 1926. xxvi, 95 p. illus. 4°. **† MNE**

Translated from the French by G. Baerlocher.

Calder, Charles A. Rhode Island pewterers and their work, together with a list of American pewterers. Providence: E. A. Johnson & Co., 1924. 38 p. illus. 8°. **MNP**

"Reprinted, with additions, from the Rhode Island Historical Society Collections."

Cornelius, Charles Over. Early American furniture. New York, London: The Century Co. [cop. 1926.] xx, 278 p. illus. 8°. (Century library of American antiques.) **MOF**

Crawford, Henry S. Handbook of carved ornament from Irish monuments of the Christian period...with a preface by Dr. R. A. S. Macalister... Dublin: Royal Society of Antiquaries of Ireland, 1926. viii, 79 p. illus. 4°. **MGI**

Einstein, Carl. Die Kunst des 20. Jahrhunderts. Berlin: Propyläen-Verlag, 1926. 575 p. illus. 4°. (Propyläen-Kunstgeschichte. [Bd.] 16.) **MAL**

Flaccus, Louis William. The spirit and substance of art. New York: F. S. Crofts & Co., 1926. ix, 432 p. 8°. **MA**

Gallotti, Jean. Moorish houses and gardens of Morocco... New York: W. Helburn, Inc. [1925.] 2 v. illus. 4°. **MQWW**

Geiger, Benno. Drawings of old masters from the collection of Dr. Benno Geiger; preface by Hugo von Hofmannsthal; text by Dr. Leo Planiczig...and Dr. Hermann Voss... Zurich: Amalthea Pub. Off. [1925?] 30 p., 100 mounted pl. f°. (Sammlung Geiger. [v.] 1.) **† MBH**

Added title-page in German.
Text in English and German.
no. 94 of 326 copies printed.

Jackson, Emily. Catalogue of 3,800 named and dated American silhouette portraits by August Edouart...discovered by Mrs. F. Nevill Jackson... [London, 1926.] 191–231 p. 4°. **MBC**

Krom, Nicolaas Johannes. L'art javanais dans les musées de Hollande et de Java. Paris: G. van Oest, 1926. 80 p., 60 pl. f°. (Ars asiatica. [v.] 8.) **† MAF**

Art, continued.

Kuenstle, Karl. Ikonographie der Heiligen. Freiburg im Breisgau: Herder & Co., G.m.b.H., 1926. xiv, 606 p. illus. 4°. **MAIH**

Le Blond, Elizabeth Alice Frances Hawkins-Whitshed. The old gardens of Italy; how to visit them, by Mrs. Aubrey Le Blond; with illustrations from her photographs. New York: Dodd, Mead and Co., 1926. xiii, 172 p. illus. 8°. **MSK**

Ludovici, Anthony Mario. Personal reminiscences of Auguste Rodin. Philadelphia: J. B. Lippincott Co., 1926. xi, 204 p. illus. 8°. **MGO (Rodin)**

Ludy, Robert Borneman. Historic churches of the world. Boston, Mass.: The Stratford Company, 1926. 3 p.l., v–xvi, 325 p. illus. 8°. **MRBL**

Morgan, John Hill. Paintings by John Trumbull at Yale University of historic scenes and personages prominent in the American Revolution. New Haven: Pubished for the Associates in Fine Arts at Yale University by the Yale University Press, 1926. 90 p. illus. 4°. **MCX (Trumbull)**

Northend, Mary Harrod. American glass; llustrated with photographs from the colection of the author. New York: Dodd, Mead & Company, 1926. xviii, 209 p. illus. 8°. **MPW**

Park, Lawrence. Gilbert Stuart; an ilustrated descriptive list of his works, compiled by Lawrence Park, with an account of his life by John Hill Morgan, and an ppreciation by Royal Cortissoz. New York: W. E. Rudge, 1926. 4 v. illus. f°. **† MCX (Stuart)**

Work concluded after the death of the author by William Sawitzky, Mrs. E. Hadley Galbreath, John Hill Morgan and Theodore Bolton.

Pauli, Gustav Th. Venedig. Leipzig: E. A. Seemann, 1926. 240 p. illus. 5. ed. 12°. Beruehmte Kunststätten. Bd. 72.) **MQWB**

Paulin, Mlle. V. Manuel de broderies et entelles... Paris: J.-B. Baillière et fils, 926. 338 p. illus. 16°. (Bibliothèque proessionnelle.) **MOT**

Rosenthal, Doris, compiler. Animal mofs; 50 plates of which 6 are in color, comiled by Doris Rosenthal. New York City: . C. Perleberg [cop. 1926]. 50 pl. f°. Prim-art series. v. 1.) **† MLM**

Waters, William George. Italian sculpors. London: Methuen & Co., Ltd. [1926.] xi, 285 p. illus. 2. ed., enl. 12°. **MGI**

Wirth, Zdeněk. Die čechoslovakische unst von der Urzeit bis zur Gegenwart; ne Auswahl hervorragender Werke der rchitektur, Plastik, Malerei, sowie des Kunstgewerbes in der Čechoslovakei, zusammengestellt von Zdeněk Wirth. Begleittext von V. Birnbaum, A. Matějcěk, J. Schránil, Z. Wirth. Prag: "Orbis," 1926. 36 p. illus. f°. **† MAM**

Wulff, Oskar, and W. F. Volbach. Spaetantike und koptische Stoffe aus ägyptischen Grabfunden in den Staatlichen Museen, Kaiser-Friedrich-Museum, Ägyptisches Museum, Schliemann-Sammlung; hrsg. im Auftrage des Generaldirektors der Staatlichen Museen... Berlin: E. Wasmuth [1926]. xiii, 159 p., 135 pl. f°. **† MON**

America

Barclay, William Singer. The land of Magellan. London: Methuen & Co., Ltd. [1926.] viii, 240 p. illus. 8°. **HKT**

Chapin, Howard Millar. Privateer ships and sailors; the first century of American colonial privateering, 1625–1725. Toulon: G. Mouton, 1926. 256 p. illus. 8°. **VYE**

Dyott, George Miller. On the trail of the unknown in the wilds of Ecuador and the Amazon. London: T. Butterworth, Ltd. [1926.] 288 p. illus. 8°. **HGN**

Gann, Thomas William Francis. Ancient cities and modern tribes; exploration and adventure in Maya lands. London: Duckworth [1926.] 256 p. illus. 8°. **HBC**

Garvin, Amelia Beers Warnock. Canadian houses of romance, by Katherine Hale [pseud.], with drawings by Dorothy Stevens. Toronto: The Macmillan Co. of Canada, Ltd., 1926. xv, 213 p. illus. 8°. **HWY**

Hammond, Melvin Ormond. Canadian footprints; a study in foregrounds and backgrounds. Toronto: The Macmillan Co. of Canada, Ltd., 1926. xvi, 305 p. illus. 8°. **HWE**

Harlow, Vincent Todd. A history of Barbados, 1625–1685. Oxford: Clarendon Press, 1926. xviii, 347 p., 1 facsim. 8°. **HRG**

McInnes, Thomas Robert Edward. Chinook days, by Tom MacInnes... Nine drawings by J. Howard Smith, two drawings by John Innes. [Vancouver, Canada: Sun Pub. Co., Lt.,-1926.] 206 p. illus. 16°. **HYE**

no. 24 of one thousand copies printed for the opening of Grouse mountain highway and scenic resort.

Newbigin, Marion Isabel. Canada: the great river, the lands and the men. New York: Harcourt, Brace and Co. [1926.] xv, 308 p. illus. 8°. **HWI**

Pearson, Hugh. The diamond trail; an account of travel among the little known Bahian diamond fields of Brazil. London: H. F. & G. Witherby, 1926. x, 15–230 p. illus. 8°. **HFY**

CIRCULATION STATISTICS FOR THE MONTH OF APRIL, 1927

BRANCHES	CIRCULATION		NEW REGISTRATIONS	VOLUMES ACCESSIONED
	HOME USE (VOLUMES)	READERS OF REFERENCE BOOKS		
MANHATTAN				
Central Building:				
Central Circulation	57,695	---	905	828
Children's Room	3,595	3,667	64	204
Extension Division*	59,685	---	468	1,183
Library for the Blind	3,846	---	9	247
East Broadway, 33	11,863	1,593	176	243
East Broadway, 192	26,443	3,515	388	762
Rivington street, 61	19,561	2,573	281	576
East Houston street, 388	22,827	3, 677	294	912
Leroy street, 66	13,032	1,259	178	221
8th street, 135 Second avenue	14,369	666	164	220
10th street, 331 East	25,930	2,954	383	532
13th street, 251 West	12,652	1,597	125	113
23rd street, 228 East	11,444	1,186	189	370
23rd street, 209 West	9,721	1,672	202	560
36th street, 303 East	9,863	1,034	109	311
40th street, 457 West	10,016	661	101	255
50th street, 564 Lexington avenue	9,347	761	128	66
51st street, 742 Tenth avenue	14,002	1,006	171	141
58th street, 121 East	13,920	1,800	231	305
58th " 121 " Music Library	2,439	1,877	---	31
67th street, 328 East	17,822	2,007	235	333
69th street, 190 Amsterdam avenue	14,713	1,755	224	360
77th street, 1465 Avenue A	19,118	768	157	737
79th street, 222 East	19,771	1,106	286	730
81st street, 444 Amsterdam avenue	16,620	1,139	327	263
96th street, 112 East	31,666	4,098	257	826
100th street, 206 West	21,401	1,199	344	521
110th street, 174 East	25,986	2,754	326	575
115th street, 203 West	19,756	1,390	259	464
124th street, 9 West	13,884	1,009	257	133
125th street, 224 East	12,091	1,027	211	634
125th street, 518 West	19,810	1,098	268	586
135th street, 103 West	12,282	2,597	213	266
145th street, 503 West	22,770	1,170	290	398
St. Nicholas avenue, 1000	19,280	1,541	218	324
179th street, 535 West	27,036	2,301	332	700
THE BRONX				
140th street, 321 East	23,178	1,606	329	475
Morris avenue, 910	19,340	1,645	267	220
160th street, 761 East	34,959	5,089	547	1,361
168th street, 78 West	12,421	2,456	299	143
169th street, 610 East	32,156	2,684	541	840
176th street and Washington avenue	39,213	4,451	620	1,119
Bainbridge avenue, 2556	36,778	3,193	603	262
Kingsbridge avenue, 3041	5,675	919	106	72
RICHMOND				
St. George	9,400	3,313	184	109
Port Richmond	11,969	1,126	119	358
Stapleton	7,852	449	98	127
Tottenville	4,993	260	20	52
Totals	904,190	85,648	12,503	21,068

* In addition 12,489 books were read at agencies of the Extension Division.

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	VOLS.	PMS.
Alumni Association of the Boston Latin School - - - -	1	
memiya, Mr. (6 photographs) -		
rraiz, F. Jimenez - - - -	1	
Batavia. De Burgemeester - -	4	7
Beeson, J. W. - - - - - -	1	
Beethoven Association - - -		1
Belgium. Minister of Science and Arts - - - - - - -	13	
Bengtson, B. E. - - - - -		1
Biblioteca de Cataluña - - -	1	
Bissell, F. R. - - - - - -	1	
Boyle, Douglas J. - - - -		1
Brachvogel, John K., and Miss Claire (collection of letters, clippings, Mss., photographs) -	4	4
Brewer, Luther A. - - - -		1
Brown, John Edwin - - -		1
Bulgaria, Bureau Général de Statistique - - - - - -	5	1
Century Association - - - -	1	
eské Akademia vèd a Umèni -	23	2
Chan Kong Ong - - - - -		1
hile. Biblioteca Nacional - -	5	1
hina. Bureau of International Exchange - - - - - -	2	
hoate, Miss Mabel - - -	208	19
inquin, Rene (3 maps) - -		
itizen's Union of the City of New York - - - - - -	170	140
rofton, Richard Hayes - -	1	
zechoslovakia. Státni Uřad Statisticky - - - - - -	6	
e Casseres, Benjamin - - -		1
e Haas, Jacob - - - - - -	6	27
evoe, Miss H. E. - - - - -	20	
orsey, Mrs. Thomas (33 periodicals) - - - - - - -	27	
uBois, Mrs. Arthur M. - -		1
lsworth, Lincoln - - - - -	2	
rdmann, Martin (2 prints) -		
kolsky, Rabbi J. - - - - -	1	
ather, William, Company -	1	
ster, Holmes - - - - - -	151	
eshfield, Edwin Hanson - -	2	
rman, Alester Garden - -	1	
nso, Emil (1 print) - - -		
lbaum, H. - - - - - -	1	
ntry, Frank M. - - - - -	1	
eenbank, Mrs. H. J. (5 charts)		
aranty Trust Company of New York - - - - - -	129	125
dden, Charles Walter - -	1	
ll, Emma Shepard - - -	1	
ppenstiel, Harold Franklin -		1
rschensohn, Rabbi Ch. - -	1	
lt, Mrs. Henry (1 plaster ust, 22 photographs) - -		

	VOLS.	PMS.
Hull, Miss Mary B. - - - -	47	5
India. Bombay Municipality, Municipal Commissioner - -	18	
Indritz, Morris - - - - -	1	
Israel, Alfred D. - - - -		1
Jaffray, Robert - - - - -	12	15
Janovici, S. - - - - - - -	24	34
Joffe, Judah A. - - - - -	1	
Jung, Rabbi Leo - - - - -	1	
Keegan, Rev. Robert F. - - -	1	
Leonidov, Daniel (19 periodicals) - - - - - - -	8	11
Lighthall, W. D. - - - - -	1	
Lum, Chung P. - - - - - -	1	
Lybrand, William M. - - -	8	
Mackay, Clarence H. - - -	1	
Masarykovy University - - -	11	74
Matsunami, Dr. N. - - - -	1	
Meisner, Oberrat Andreas - -	2	
Moçambique, Provincia de. Alto Commissariado - - - -		1
Orlik, Prof. Emil (1 print) -		
Oslo. Kommunale folkeregister og statistiske kontor - - -	7	2
Page, William Adino - - -	2	
Parsons, Gen. William Barclay -	1	
Persia. Administration of Customs - - - - - - - -	1	
Peru. Consulate at New York -	6	
Poland. Głovny Urzad Statystyczny - - - - - - -	3	
Poole, Mrs. Fanny H. Runnells		1
Ptacek, Mrs. I. - - - - -	118	
Roberts, B. H. - - - - - -	2	
Rosenfeld, Samuel - - - -	2	
Rosenfeld, Yonah Committee -	1	
Roumania. L'Attaché Commercial en France - - -	1	5
Roumania. Ministère de Finances - - - - - - -	3	3
Savin, William M. - - - -		1
Smith, Charles Harmon, Jr. - -	1	
Stein, L. M. - - - - - -	4	8
Struller, Hermann (158 stamps)		
Tanganyka Territory. Department of Agriculture (18 cards) - - - - - - -		2
Walker, Edwin (1700 periodicals) - - - - - - - -	124	1,050
West, Levon (1 print) - - -		
Wheeler, Monroe - - - -		1
Worden, Mrs. J. L. (1 portfolio)	8	
Zarevant, Mr. - - - - - -	2	

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Facts for the Public	.05
Central Building Guide	.05
Questions About Your Library (General Information about the Library)	Free
For Sightseers. Central Building	Free

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Annual Report of The New York Public Library. (A limited number are given free upon request.)

Bulletin of The New York Public Library. Published monthly. Chiefly devoted to the Reference Department. Bibliography, news of the Library, reprints of manuscripts, descriptions of new accessions. $1.00 a year; current single numbers for 10 cents. Back numbers at advanced rates.

Branch Library Book News. A selected list of new additions to the Circulation Department, with other lists and articles. Published monthly, except in July and August. For sale at the Branches and at the Inquiry Desk. 2 cents a copy; 25 cents a year, postpaid.

New Technical Books. A selected list of books on industrial arts and engineering, recently added to the Library. Published quarterly. 25 cents a year, postpaid.

Municipal Reference Library Notes. Published weekly except during July and August, for circulation among the officials and employees of the City of New York. Price: $2.00 a year; 5 cents a copy. Apply at Room 512, Municipal Building.

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Armenia and the Armenians. A list of references. 1919	.30
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Avesta and Romani, by Albert Thomas Sinclair. 1916	.05
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Beaumarchais, Editions of, in New York City. 1925	.15
Berlin and the Prussian Court in 1798. From a ms. journal of Thomas Boylston Adams. 1916	.15
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orical Printing Club, Publications f the. (List and prices furnished pon application.)	
orical Prints and Early Views of merican Cities. Catalogue of xhibition. 1917	.05

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Holcroft, Thomas, A Bibliography of. By Elbridge Colby. 1922	.60
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Hudson, Henry, The Hudson River, Robert Fulton and Steam Navigation, List of prints, books, manuscripts, etc., relating to. 1909	.30
A Hundred Years of Grand Opera in New York, 1825–1925. A record of performances. 1927	1.00
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Insulating Oil. A list of references. 1927	.50
Inventory of the Rensselaerswyck Manuscripts. 1924	.25
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Isle de Bourbon (Réunion) Documents, 1701–1710. Printed from the original manuscript in the Library. 1909	.20
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